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FIELD AND VEGETABLE SEED PRODUCTION AND DEMAND IN EUROPE

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By

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EIGN AGRICULTURE REPORT No. 36 JUNE 1949

European countries have provided a market for significant quantities of field crop and vegetable seeds produced on the farms of the United States. During and immediately after the war, seed shipments from this country contributed heavily to food production in Europe. In turn, European countries have been important sources of certain seeds imported into the United States.

Because of the need for an appraisal of the European situation with respect to production and requirements of field crop and vegetable seeds, a survey was conducted in Europe for the Office of Foreign Agricultural Relations, during the summer and early fall of 1948, by George C. Edler, Agricultural Statistician of the Bureau of Agricultural Economics. This report summarizes Mr. Edler's first-hand observations in the respective countries and supplemental material from Government agencies in Washington and abroad.

This study was conducted under the provisions of the Research and Marketing Act of 1946. The possibilities for broadening the foreign market for other agricultural commodities are being studied, and the findings are presented in other reports and circulars available, free, from the United States Department of Agriculture, Office of Foreign Agricultural Relations, Washington 25, D. C.

Joseph A. Becker

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ACKNOWLEDGMENT

The following report is based largely upon information obtained during the summer of 1948 from the seed trade and agricultural officials in 12 European countries: Austria, Belgium, Czechoslovakia, Denmark, England, France, Germany, Hungary, Italy, the Netherlands, Sweden, and Switzerland. The information thus obtained was supplemented by data taken from reports or records of United States foreign officials and those of the United States Departments of Agriculture and Commerce.

To all these individuals and agencies the writer is deeply indebted and hereby expresses his appreciation. Obviously, some of the information obtained could not be divulged in the form given to him because it was more or less confidential. The writer has tried to record as accurately as possible the information he obtained and which he felt privileged to incorporate in this report.

FIELD AND VEGETABLE SEED PRODUCTION AND DEMAND IN EUROPE

By

George C. Edler
Agricultural Statistician

DEMAND FOR UNITED STATES SEEDS

Europe sows large quantities of only a few kinds of agricultural (field) seeds of which the United States frequently produces a surplus. These seeds are red clover, alfalfa, ryegrass, and common vetch seed. Fairly large quantities of crimson-clover seed are also sown,in Europe, but the United States has seldom, if ever, produced more of this seed than it needed to cover its own requirements. To be sure, some crimson-clover seed has been exported, usually at the end of the season or when it brought higher prices in foreign countries than in the United States.

Europe's consumption of three important grass seeds--timothy, redtop, and Kentucky bluegrass--which normally are produced in surplus quantities in the United States, is generally surprisingly small. This is due, in part, to the fact that a majority of European countries prefer legumes to grasses for pastures and meadows, sow many different kinds of grasses in mixtures instead of only one or two kinds as is done in the United States, and use grasses for lawns that are more or less native to Europe.

Lawns in Europe are not commonly sown to Kentucky bluegrass and redtop as practiced in the northern half of the United States. Other grasses are used, such as Chewings fescue, crested dogtail, and browntop in England; perennial ryegrass, crested dogtail, and rough bluegrass (Poa trivialis) in Switzerland; creeping bent, fine-leaved bent, and Agrostis canina in the Netherlands; red fescue, rough bluegrass, perennial ryegrass, and white clover in Denmark.

Dealers in a few countries, however, indicated that some of the American grass seeds were used in lawnseed mixtures. In France, for this purpose, Kentucky bluegrass, ryegrass, timothy, crested dogtail, and white clover are sometimes used; and, in Holland, Kentucky bluegrass, redtop, and red fescue are often used.

With the increasing production of creeping red-fescue and Chewings-fescue seed in the United States, additional outlets for these seeds will

have to be found. At the moment, western Europe looks to be the most promising. There is practically no Chewings-fescue seed produced in Europe, or at least not by that name. Denmark and Sweden apparently are the only countries in Europe that produce surpluses of red-fescue seed.

Orchard grass and meadow fescue, principally in mixtures, are more important grasses in Europe than in the United States. But Denmark usually can supply most of the demand for these seeds, and European countries prefer Danish seeds to those of United States origin.

Seedsmen in Europe enjoyed a good business in 1947. In fact, in England, some of them did nearly a record volume. Carry-overs into the 1948 crop year of both field and vegetable seeds were below normal. Farmers in most European countries, as well as in the United States, are more prosperous now than they have been in years. For this reason and because they prefer to grow hay and pasture crops rather than grain crops, they are expected to plant more grass and clover seeds than in the recent past.

Commercial growers of vegetable seeds, greatly handicapped by the war when it was more important to produce food crops than seed crops, are again striving to regain some of the ground they lost. They are endeavoring to build up their stock seed to the high plane of prewar years. Apparently, they have already taken over some of the business done by United States seedsmen during and shortly after the war. This is reflected in part by the fact that exports from the United States, July 1, 1948, to March 31, 1949, were much smaller this year than for the same period a year earlier for seeds of the following kinds; dwarf green beans, lima beans, garden beet, mangel beet, Brussels sprouts, cabbage, celery, Swiss chard, cucumber, endive, kale, lettuce, muskmelon, watermelon, parsley, pepper, radish, rutabaga and turnip, spinach, and tomato. Exports were a little smaller than a year earlier for pole beans, Chinese cabbage, cauliflower, eggplant, kohlrabi, mustard, okra, and squash. But exports were much larger than a year ago for carrot, chicory, and leek and a little larger for broccoli, sweet corn, onion, parsnip, smooth peas, wrinkled peas, and pumpkin. Furthermore, European supplies of most seeds, both field and vegetable, are more plentiful than a year ago. These factors, together with the shortage of American dollars, have curtailed the demand for United States seeds in Europe. The European Recovery Program has helped, and will continue to be of assistance, in fostering the purchases of seeds in the United States by European dealers; but, apparently, the need for dollars for the purchase of other commodities is more pressing. This is particularly true in the cases of certain so-called luxury seeds, such as Kentucky bluegrass and redtop seed, that are of more esthetic than agricultural importance. In some countries, seed-import boards apparently are reluctant to allow the importation of much seed that is primarily lawn, rather than agricultural, seed.

Although there are many obstacles--some of which will be brought out in this report--for United States seedsmen to surmount in doing business with seedsmen in Europe, the quantity of seed exported probably could be greatly increased. Europe is now only an over-night run from the United States by airplane. One can leave New York City after office hours and be in London by about noon the next day. More and more United States seedsmen are sending representatives to Europe who have been trained in the European seed business, and some of these representatives speak other languages besides English. European farmers have little knowledge of the merits of seeds produced in the United States. Publicity along this line ought to pay good dividends in time. This would tend to combat some misinformation regarding United States grown seed that has been disseminated.

GENERAL EUROPEAN OBSERVATIONS

In 1948, large grain crops in most European countries relieved the tense food situation that had arisen chiefly because of a succession of short crops; and in some of the 12 countries visited between mid-July and mid-September, the 1948 crops were the best in a number of years.

Rainfall was somewhat deficient early in the spring of 1948; but, by the end of May or the beginning of June, rains fell frequently and continued unitl mid-July or a little later. By that time, many farmers feared that they might not be able to harvest their crops or that the crops would be damaged by rains. Fortunately, the rains abated by about July 20; and, generally speaking, favorable harvesting weather prevailed during the latter part of July, August, and early part of September. Normally the weather is less settled in the late summer and early fall in Europe, particularly in the more northern countries, than in the United States.

Legume and grass-seed crops in Europe did not fare so well in 1948 as in 1947. The weather in the late summer and early fall of 1947 was so dry that many fields of clover and grass seed, sown in the spring of 1947, made a poor growth, and some of the fields were plowed up. As a result there was a marked decrease in the acreage of these crops for harvest in 1948. Furthermore, the June and July rains delayed the harvest of hay crops and seed crops were harvested later and yields were more uncertain than usual. Generally speaking, the dry weather of 1947, in contrast to the wet weather of 1948, was favorable for the production of alfalfa and clover-seed crops. Fortunately the carry-over, in a few countries, from the rather large 1947 and fairly large 1946 crops of some of these seeds tended to offset the prospective below-average production in 1948.

With few exceptions, one has to depend on men in the seed trade for information regarding the prospective production of various seed crops, because there is little official statistical information available, except in a few countries--notably Denmark, England, and Holland--to serve as a yardstick or basis for forecasting current production. The people and gov-

ernments in Europe are not statistically inclined with respect to seed, and the seed trade showed little interest in obtaining early official information on the various seed crops. Of the 12 countries visited during the summer, Denmark, alone, had printed official figures available that covered the 1948 acreage of some of the seed crops. None of the countries had issued official figures covering prospective production or yield per acre. Likewise, none had issued official stock (carry-over) figures, and, although these data had been collected in England, they were available for Government use only.

The few seed-cleaning plants inspected were fairly well-equipped with machinery--far better than those observed in Europe 24 years ago. Many of them have magnetic machines for separating dodder from alfalfa, red clover, and other seeds, as well as fanning mills similar to those commonly used in the United States. Fewer American-made machines were seen, however, than had been expected.

On the Continent, most seeds are packed in burlap or jute bags, the bag and seed weighing 100 kilograms, or 220.46 pounds. Generally, there is no separate charge made for the bag; but the buyer pays for it, nevertheless, as it is weighed in with the seed. A buyer of seed priced at 30 cents a pound pays the equivalent of 60 to 65 cents for the bag, which weighs about 2 pounds.

Generally speaking, seeds offered for sale in Europe are of lower grade with respect to purity and germination than those commonly sold in the United States. Apparently, however, farmers in some of the European countries are more origin- or strain-minded than are United States farmers. There was no way of checking the extent to which farmers receive information regarding the actual country of origin of different seeds. There seems to be some prejudice against certain kinds of seeds produced in the United States. This prejudice apparently is based on hearsay evidence, rather than on more convincing experimental evidence. It is akin to the "notion" of many farmers in the United States that, after a number of years, oats sown on the same farm degenerate into wild oats or that red-clover and timothy seeds are used in the manufacture of dyes. Consistent results of official tests conducted under controlled conditions in Europe with seed of United States origin in comparison with seed of other origins were not found.

The sale of some seeds in certain countries--particularly in Holland and Denmark, and to a lesser extent in Austria--is under more rigid supervision or control than in the United States. Several of the seed laboratories--Bologna, Italy; Vienna, Austria; Wageningen, Holland; and perhaps others--were badly damaged or pillaged during World War II, but these laboratories are being reequipped. Generally speaking, the European seed laboratories do not have so much mechanical equipment for making separations (purity tests) as the laboratories in the United States have. Most of them prefer to make separations on or over dark paper.

Certain countries, which in the past counted as impurities broken seeds of the kind examined, have adopted or are about to adopt the method used

in the United States of counting individual seeds, more than half of which are intact, as pure seed. A number of complaints were received about the results of germination tests, particularly with reference to radish seed. In certain European countries a few persons in the governments and in the seed trade explained that the laboratories obtained higher germination tests by varying the temperatures, whereas it was alleged that United States laboratories employed more or less constant temperatures. This and other matters will be discussed at the meeting of the International Seed Testing Association in Washington, D. C., during the week of May 8, 1950.

Countries that are relatively small producers or consumers of seeds frequently import or export relatively large quantities of these seeds. This is due to one or more of several things, such as (1) they may have other commodities to barter with; (2) they may have a balance of trade in their favor, or their customer country may have such a balance; or (3) they may at the moment have more money of the kind in demand than the other countries; hence, they can pick up bargains and thereby subsequently undersell seedsmen in other countries. As an illustration of bartering, an actual case occurred in Switzerland where a dealer bought rice in Egypt, which he traded to a dealer in Czechoslovakia for sugar. This sugar, in turn, was sold to a third dealer in Italy for Swiss francs, of which there is usually a favorable balance because Italy exports more goods to Switzerland than she imports from that country. While the writer was in Europe, orchard-grass seed of Danish origin was selling competitively at a price about 30 percent higher than that of American seed. This was due, in part, to the fact that European countries prefer the Danish seed, but it was chiefly due to the prevalance of Danish kroners and the scarcity of American dollars.

Prior to World War I, Germany imported more seed than any other country in Europe, and most of these imports came from Europe. Today, Bizonia (the area of western Germany that is occupied by the United States and British forces) is the largest buyer of seeds in Europe. Early in 1948, it was estimated that approximately 35 million dollars worth of field and vegetable seeds would be required to fill Bizonia's requirements for the 1948-49 season. In the purchase of seeds by the Bipartite Control Office, seedsmen in the United States have contended that they should be given preference over foreign seedsmen because of the millions of American dollars being spent there. The Foreign Aid Appropriation Act, 1949, approved June 28, 1948, in effect, does not permit seed purchases at prices higher than the prevailing market price in the United States at the time of the purchase, although it permits adjustments for differences in the cost of transportation to destination, quality, and in terms of payment. On the other hand, foreign seedsmen have contended that recovery or rehabilitation of their countries will be delayed, if they are virtually denied outlets or markets for their exportable surpluses in countries, such as Germany, that are traditional customers. In obtaining ECA dollars for seeds, they have hoped to bring exports into closer balance with imports.

Country	Unit	U. S. cents
Austria	Schilling	0.10
Belgium	Franc	2.32
Czechoslovakia	Koruna	2.04
Denmark	Krone	21.00
England	Pound	404.00
France	Franc	0.33
Germany	Mark	30.00
Hungary	Forint	8.70
Italy	Lira	0.18
Netherlands	Guilder (or florin)	38.00
Sweden	Krona	28.00
Switzerland	Franc	23.40

The accompanying table gives the English, Latin, French, and German names of 42 kinds of field seeds.

TABLE 1.- *Names of field seeds in English, Latin, French, and German*

ENGLISH	LATIN	FRENCH	GERMAN
Alfalfa	Medicago sativa	Luzerne	Luzerne
Clovers:			
Alsike	Trifolium hybridum	Trèfle hybride	Bastardklee, Schwedenklee
Crimson	Trifolium incarnatum	Trèfle incarnat	Incarnatklee
Hop	Trifolium agrarium	Trèfle des campagnes	Gelber Hopfenklee
Low hop	Trifolium procumbens	Trèfle couché	Feldklee, Liegenderklee
Ladino	Trifolium repens giganteum		Ladinoklee
Red	Trifolium pratense	Trèfle violet	Rotklee, Wiesenklee
White Dutch	Trifolium repens	Trèfle blanc	Weissklee
White sweet	Melilotus alba	Mélilot blanc	Weissblühend Melilotenklee
Yellow sweet	Melilotus officinalis	Mélilot jaune	Gelbblühend Melilotenklee
Fescues:			
Hard	Festuca ovina duriuscula	Fétuque durette	Härtlicher Schwingel
Meadow	Festuca elatior (F.pratensis)	Fétuque des prés	Wiesenschwingel
Red (Chewings)	Festuca rubra	Fétuque rouge	Rotschwingel
Sheep	Festuca ovina	Fétuque ovine	Schafschwingel
Grasses:			
Bermuda	Cynodon dactylon	Herbe des Bermudes	Echter Hundszahm
Smooth brome	Bromus inermis	Brome de Hongrie	Wehrlose Trespe
Creeping bent	Agrostis palustris	Agrostide tracante	Krieschendes Floringras
Canada blue	Poa compressa	Paturin comprimé	Platthalmrispengras
Kentucky blue	Poa pratensis	Paturin des prés	Wiesenrispengras
Roughstalk blue	Poa trivialis	Paturin commun	Gemeines Rispengras
Wood blue	Poa nemoralis	Paturin des bois	Hainrispengras
Reed canary	Phalaris arundinacea	Alpiste roseau	Rohrglanzgras
Crested dogtail	Cynosurus cristatus	Cretelle des prés	Kammgras
Meadow foxtail	Alopecurus pratensis	Vulpin des prés	Wiesenfuchsschwanz
Tall oat	Arrhenatherum elatius	Fromenthal	Französisches Raigras
Orchard	Dactylis glomerata	Dactyle pelotonné	Knaulgras
Redtop	Agrostis alba	Agrostide blanche	Hohes Floringras
Common (Italian) rye	Lolium multiflorum	Raygrass d'Italie	Italienisches Raigras
Perennial (English) rye	Lolium perenne	Raygrass anglais	Englisches Raigras
Westerwold rye	Lolium westerwoldicum	Raygrass westerwold	Westerwoldisches Raigras
Sudan	Sorghum vulgare sudanense	Sorgho menu	Sudangras
Timothy	Phleum pratense	Fléole des prés	Timothe
Lupines:			
Blue	Lupinus angustifolius	Lupin bleu	Blaue Lupine
Yellow	Lupinus luteus	Lupine jaune	Gelbe Lupine
Millets:			
German	Setaria italica	Moha de Hongrie	Deutschehirse
Japanese	Echinochloa crusgalli frumentacea	Millet du Japan	Huhnerhirse
Proso or broomcorn	Panicum miliaceum	Millet commun	Rispenhirse
Trefoils:			
Big	Lotus uliginosus	Lotier des marais	Sumpfschotenklee
Birdsfoot	Lotus corniculatus	Lotier corniculé	Schotenklee, Hornklee
Yellow or black medic	Medicago lupulina	Lupuline, Minette	Hopfenschneckenklee
Vetches:			
Common or spring	Vicia sativa	Vesce de printemps	Saatwicke, Sommerwicke
Hairy or winter	Vicia villosa	Vesce d'hiver	Zottelwicke, Winterwicke

ALFALFA

In August and early September a below-average crop of alfalfa seed was in prospect in Europe, largely because of frequent rains during the summer, particularly in June and the first half of July. However, because of carry-overs from the large 1946 crop and the fairly large 1947 crop, supplies available for planting in the spring of 1949 were expected to be near average levels.

It is estimated that the 12 countries visited normally plant 35 to 50 million pounds of alfalfa seed annually. Italy, France, and Hungary usually produce a surplus of this seed while the rest of the countries ordinarily produce less than their requirements.

The majority of the European farmers prefer alfalfa seed of Hungarian origin to that of any other country. "Provence" French seed is the second choice in a majority of the countries visited. Although farmers generally have had little experience with seed of United States origin, several persons reported good results with Grimm-alfalfa seed from the United States.

Information with respect to the production, requirements, imports, and exports of alfalfa seed by countries is given in the following paragraphs.

Austria

Alfalfa is grown chiefly in the valleys of Austria in the wine area of Nieder Reich, while red clover is grown on the hills or mountain slopes. The alfalfa seed crop there, as elsewhere in Europe, is usually the second crop. Normally 500,000 pounds, or less, of this seed is produced in Austria and there is rarely a surplus for export. Imports are usually less than 500,000 pounds; but, in 1947, 1,853,280 pounds were imported chiefly from France and Hungary. During the 1947-48 season, the United States Government shipped 132,000 pounds of alfalfa seed to Austria. Hungarian seed is preferred over that of all other origins, and while Italian seed is used, fields sown to it do not last for more than 3 or 4 years. Austria's 1947 crop was poor; but, because of unusually large imports, there was a larger carry-over than usual into the 1948 crop year. Prospects for the 1948 crop were fairly good about August 5.

Belgium

As a rule, Belgium produces no alfalfa seed. The 1945 and 1946 acreage of alfalfa for all purposes in Belgium averaged about 19,000 acres--less than one-third the red-clover acreage. Hungarian and Provence (France) seeds are liked best; but, because of the high price of Hungarian seed about September 1, 1948, little or no imports of seed of that origin were expected. It was estimated that a total of about 300,000 pounds of alfalfa seed would be imported from France and Italy during the 1948-49 season. These two countries have been Belgium's chief sources of supply for many years.

Czechoslovakia

Czechoslovakia normally does not produce a surplus of alfalfa seed, although, occasionally, a million pounds or more are exported. Slovakia probably produces more of this seed than do the Czech lands (Bohemia, Moravia, and Silesia). However, many fields of alfalfa were noted in Bohemia on August 1, some of them in bloom. No fields of red clover were observed, however, despite the fact that the 1948 acreage sown in the Czech lands was estimated to be $3\frac{1}{2}$ times as large as the alfalfa acreage.

In 1945 and 1946, the production of alfalfa seed in Czechoslovakia was estimated at approximately 5,300,000 and 4,100,000 pounds, respectively; in 1947 it was reported to be larger than usual; and, on August 5, the prospects for the 1948 crop were good.

Normally, it is necessary for Czechoslovakia to import about 1,000,000 pounds of alfalfa seed annually; and, ordinarily, most of this seed comes from France and Italy. However, in 1947, exports slightly exceeded imports. The 1947 exports totaled 524,700 pounds, of which 307,300 pounds went to Germany; 162,900, to Denmark; and 54,500, to the United Kingdom. Of the 522,900 pounds imported into Czechoslovakia in 1947, 283,700 pounds came from France; 163,600, from Hungary; and 75,600, from Italy. During the period February-June 1948, 902,800 pounds were imported, of which 729,500 came from France; 152,600, from Hungary; and 20,700, from other countries.

Due to the fact that alfalfa is considered more sensitive to heavy frosts than red clover, a large part of the alfalfa of Czechoslovakia is sown in the spring at the same time as (or a little later than) red clover. The usual rate of sowing is about 22 pounds per acre.

Denmark

Ordinarily, less than 50,000 pounds of alfalfa seed a year are produced in Denmark. However, in 1948, because of the sharp increase in acreage to 1,060 acres, the 1948 production was estimated at about 285,000 pounds. In 1947, 104 acres were sown to alfalfa and in 1946, 173 acres. The average yield per acre during the 1937-46 period was 233 pounds.

Denmark normally uses approximately 1,000,000 pounds of alfalfa seed annually. About 730,000 pounds were imported during the 1947-48 season, of which approximately 163,000 pounds came from Czechoslovakia and 39,000 from the United States. For a number of years, there has been a preference for seed of Hungarian and French origins.

France

France, along with Italy, has been a leading European country in the production of alfalfa seed. This seed is produced chiefly in the west-central, north-central, and southern areas of France. Provence alfalfa, which is highly regarded in several European countries, is produced in the south-

eastern part of France. In recent years, the Departments of Vendee and Sevres (Deux), a little to the north of the west-central part of France, have produced the bulk of the crop.

The 1948 production was estimated at about 17,700,000 pounds, compared with 22,700,000 pounds in 1947. This crop was much larger than the crops in the early 1920's, which averaged about 13,600,000 pounds; but it was much smaller than the 1946 crop of 31,700,000 pounds and the 1929 crop of 38,900,000 pounds. The carry-over, consisting chiefly of 1946-crop seed, was about 2,000,000 pounds. The 1948 production plus carry-over, estimated at 24,700,000 pounds, is about 14,700,000 pounds in excess of France's domestic consumption of approximately 10,000,000 pounds.

Exports during the 1930-39 period averaged about 3,300,000 pounds. About one-third went to Germany, while most of the remainder went to Switzerland, Czechoslovakia, Russia, the United Kingdom, Austria, Belgium, and Poland. The largest quantity imported from France into the United States was 2,905,700 pounds during the 1923-24 season. No alfalfa seed has been imported into the United States from France since the 1937-38 season, when 355,000 pounds were received.

Germany

Production of alfalfa seed in Germany has always been small. Although as much as 217,300 pounds were imported by the United States from Germany during the 1923-24 season, Germany's production probably has never equalled its requirements. In a favorable year, Bizonia could produce 200,000 to 400,000 pounds, and the French zone could produce a little less. The estimated 1948-49 requirement for Bizonia was approximately 4,500,000 pounds, and the largest quantity was expected to come from France. In a drive from Frankfurt to Hamburg, only one alfalfa field was observed, while several red-clover fields were noted.

During the 1930-39 period, Germany imported approximately 8,000,000 pounds of alfalfa seed annually. Nearly one-half of this quantity was imported from Hungary, but large quantities also came from France, Italy, Rumania, Yugoslavia, and the United Kingdom.

Hungary

During the past 3 or 4 years, the acreage of alfalfa sown in Hungary for all purposes has not declined so much through the division of large estates by the Government as the acreage sown to clover. In 1947, there were about 556,000 acres of alfalfa and 149,300 acres of clover, compared with the 1932-38 average of 504,800 acres of alfalfa and 375,400 acres of clover.

The goal set for the 1947 production of alfalfa seed in Hungary was approximately 22,000,000 pounds, but it is believed the production actually fell far short of that quantity. The 1939-43 average production was

13,297,000 pounds, compared with the 1932-38 average of 16,940,000 pounds. In mid-August prospects for the 1948 crop were for a below-average crop. Prior to 1939, exports averaged about 5,000,000 pounds, of which more than two-thirds was exported to Germany while the remainder went chiefly to Russia, Denmark, Austria, Sweden, and Poland. During the 1939-43 period, exports of alfalfa seed from Hungary ranged from nothing in 1942 to 5,075,000 pounds in 1939 and averaged 2,341,000 pounds. During that period, nearly nine-tenths of the exports went to Germany, and most of the remainder was exported to Sweden, Denmark, Bulgaria, and the Netherlands. During the past 30 years, the United States has imported a total of only 132,500 pounds of alfalfa seed from Hungary.

Italy

In recent years, Italy has led other European countries in the production of alfalfa seed. The 1948 crop is estimated officially at 34,462,000 pounds, compared with 36,116,000 pounds in 1947. The decreased production of 1948 was due to the smaller acreage harvested, as the yield (188 pounds) per acre was reported to be the same as that of 1947. There was a large carry-over into the 1948 crop year. On August 23, Italian alfalfa seed was quoted at about $22 per 100 pounds by wholesale seedsmen.

In the past, most of the exports went to Germany, South America, Switzerland, Czechoslovakia, Russia, Yugoslavia, France, Austria, and Bulgaria. During the 1919-20 season, imports of 9,151,900 pounds were the largest ever received by the United States from Italy. No alfalfa seed has been exported to the United States since the 1924-25 season, when a total of 499,400 pounds was imported from Italy.

Netherlands

The Netherlands requirement of alfalfa seed is approximately 400,000 pounds annually. Inasmuch as that country produces little, if any, of this seed, it has to depend upon imports, which in recent years have exceeded domestic requirements by about 75,000 pounds. As a rule, these imports have come chiefly from Hungary and France. Good results from Grimm alfalfa of United States and Canadian origins have been reported, but the largest quantity of alfalfa seed known to have been imported from the United States was 36,800 pounds in 1933.

Sweden

Production of alfalfa seed in Sweden is very small. Hence, this country depends upon imports for its requirements, which are estimated at 660,000 pounds annually. During 1947, however, only about 330,000 pounds were imported. Of that quantity, about 197,000 pounds came from Hungary; 112,000, from the United States; 20,000, from Canada; and 1,000, from France. The largest imports of alfalfa seed from the United States occurred

in 1941, when 498,000 pounds were exported to Sweden. Good results have been obtained with Grimm and Cossack alfalfa, as well as northern-grown, common alfalfa seed from the United States. During mid-September, the third crop of alfalfa in southern Sweden was being dried on racks.

Switzerland

Switzerland produces little or no alfalfa seed. Prior to 1939, imports for her use, as well as for export, averaged about 700,000 pounds, nearly all of which came from France, Italy, Hungary, and Czechoslovakia. The largest exports from the United States to Switzerland occurred in 1942, when 154,000 pounds were shipped.

United Kingdom

The average production of alfalfa seed in the United Kingdom is less than 50,000 pounds, while the domestic requirement has been 500,000 to 600,000 pounds. To take care of the increasing acreage for hay production, the requirement for the 1948-49 season was raised to 900,000 pounds. The carry-over of alfalfa seed on May 31, 1948, was much smaller than that of the preceding year, but it was slightly above the 1942-46 average. The largest quantity ever exported from the United States to the United Kingdom was 169,000 pounds, during the 1941-42 season.

RED CLOVER

The unusually dry weather during the fall and early winter of 1947 killed much of the 1947 spring sowing of red clover, from which the bulk of the 1948 seed crop normally would have been harvested. Then frequent, heavy rains at the time the first crop of medium red clover hay was ready to be cut delayed the harvesting of the second crop for seed. Rains continued during pollination, with the result that the seed was not expected to set well.

Of the 12 countries visited, France and Czechoslovakia probably produce the most red-clover seed. Normally, the production in these countries, in the aggregate, falls short by about 15 to 20 million pounds of meeting their estimated requirements of 90 to 100 million pounds. The deficiencies in the past have been made up by exports chiefly from Poland and Rumania, which countries were not included in this study.

At the time the European countries were visited, it was too early to forecast the 1948 production with any degree of accuracy. It appeared, however, that about average crops would be produced in Austria, Czechoslovakia, France, Italy, and Sweden but that below-average crops would result in Belgium, Denmark, Bizonia, Hungary, the Netherlands, and the United Kingdom. In a few countries--England, Denmark, Belgium, and Switzerland --the 1947 crop was a record or near-record one.

Figure 1.--Orchard grass in shocks near Boston, England. Important for its seed, it was given priority protection during the war. (July 19, 1948.)

Figure 2.--Mr. Edler in a field of red clover near Hannover, Germany. Germany annually uses millions of pounds of red-clover seed but has seldom, if ever, produced a surplus. (July 30, 1948.)

Figure 3.--Mr. Edler (left) with two German scientists in a field of sweet lupine on a seed farm near Celle. (July 28, 1948.)

Apparently, the origins that a majority of the European farmers liked best are Hungarian, Czechoslovakian, Rumanian, and Polish. This is probably due chiefly to the fact that these countries traditionally had the largest exportable surpluses; hence, farmers in the importing countries were more apt to specify those origins when home-grown (native) seed was not available. The complaints against the pubescence (or hairiness) of American seed that were heard 24 years ago are still being made. However, only hearsay evidence of alleged deleterious effects of feeding red-clover hay produced from seed of United States origin was presented. Results of official tests in Europe of the winter hardiness of various origins of red-clover seed, such as those obtained in Canada during the winters of 1923-24 to 1927-28, were unobtainable. The Canadian tests at Ottawa indicated that only home-grown and Swedish seed proved to be hardier than seed from the United States.

Austria

During the occupation of Austria by Germany, practically no red-clover or alfalfa seed was produced; but, since 1945, efforts have been made to increase the production of these seeds. The commercial production of red-clover seed in recent years has been about 750,000 pounds. The 1947 crop was rather poor; but, in early August, the 1948 crop looked promising. During the 1930-39 period, an average of about 2,200,000 pounds was produced.

Prior to 1939, an annual average of about 1,400,000 pounds was exported from Austria, the bulk of which went to Germany. Prewar imports, however, exceeded exports and averaged about 1,700,000 pounds. Most of these imports came from Rumania, Poland, Czechoslovakia, Yugoslavia, and Lithuania. In 1947, 323,840 pounds were imported from France. The largest exports (264,050 pounds) from the United States to Austria occurred in the 1946-47 season.

Belgium

The acreage of red clover sown for all purposes in Belgium in 1945 and 1946 averaged 62,500 acres, and the production of seed in those years probably did not exceed 300,000 pounds. The 1947 crop of about 550,000 pounds was reported to be the largest ever harvested in Belgium. On September 1, the 1948 crop was estimated at about 100,000 pounds.

During 1947, Belgium imported about 207,000 pounds of red-clover seed from Czechoslovakia and 70,000 pounds from France. The largest export (239,543 pounds) from the United States to Belgium was recorded during the 1945-46 season. Prior to 1939, an average of about 1,100,000 pounds was imported into Belgium, chiefly from the United Kingdom, Poland, and Latvia.

Czechoslovakia

The 1948 production of red-clover seed in Czechoslovakia is estimated at approximately 15,000,000 pounds. Official figures indicated that 19,800,000 pounds were produced in 1945 and 15,400,000 pounds in 1946. Most of the production is in the Czech lands. In December 1948, the Ministry of Agriculture issued orders for growers to deliver to official collectors before January 31, 1949, all their 1948 crop of red-clover seed, except the seed needed by the growers for planting.

Most of the red-clover seed is sown in Czechoslovakia in the spring--March or early April--at the rate of about 18 pounds per acre. Yields of 200 pounds per acre are not uncommon.

In 1947, 621,700 pounds were exported by Czechoslovakia, of which 392,200 pounds went to Austria, 207,500 to Belgium, and 22,000 to Denmark. During the first half of 1948, 132,300 pounds were exported. Prior to 1939, an average of about 3,600,000 pounds was exported, most of which went to Germany. Smaller quantities were exported to Russia, Sweden, Austria, and other countries.

Imports of red-clover seed into Czechoslovakia have long been discouraged by theGovernment, presumably in an effort to keep the domestic strains as pure as possible. However, during the first half of 1948, 208,300 pounds were imported.

Denmark

Production of red-clover seed in Denmark during the 3 years, 1946, 1947, and 1948, averaged about 5,900,000 pounds. Of this quantity, about 25 percent was medium and 75 percent was mammoth red clover. The 1948 acreage (16,630 acres) was indicated to be 80 percent of the 1947 acreage and 73 percent of the 1946 acreage. The 1948 yield per acre was expected to be below average.

During the 1947-48 season the consumption of red-clover seed in Denmark was about 5 million pounds. Only a little of this seed was imported during the 1947-48 season; and little or no imports were anticipated during the 1948-49 season, as the carry-over into the 1948 crop was much larger than usual. The largest quantity ever exported from the United States to Denmark (160,724 pounds) was shipped in 1923. Prior to 1939, when production of this seed in Denmark apparently was smaller than in recent years, imports averaged about 3,700,000 pounds. Nearly three-fourths of these imports came from Poland.

France

The 1948 crop of red-clover seed in France was apparently much larger than had been expected early in the fall. On April 1, 1949, the crop was estimated at approximately 22,000,000 pounds, compared with 19,840,000 pounds in 1947 and the 1944-46 average of 14,960,000 pounds.

Exports of this seed during the 1948-49 season were expected to exceed 10,000,000 pounds, compared with exports of 2,870,000 pounds in the preceding season, including about 1,670,000 pounds to western Germany; 660,000, to United States dealers, most of which went also to western Germany; 70,000, to Belgium; 44,000, to the Netherlands; and 7,000 pounds to Switzerland. Of the 2,200,000 pounds exported in the 1946-47 season, 660,000 went to the French zone of Germany; 374,000 each, to Austria and Yugoslavia; 176,000, to Belgium; 154,000, to Poland; 77,000 to Switzerland; and 385,000 to other countries.

The largest quantity ever imported from France into the United States was 18,889,600 pounds during the 1925-26 season. On the other hand, the largest quantity ever exported from the United States to France was 976,-450 pounds in 1933. During the past 2 years, France imported about 1,870,-000 pounds in the aggregate from the United States, England, and Canada.

Germany

In Bizonia, a crop of red-clover seed, such as that of 1947, which approximated 2,200,000 pounds, occurs only once in 8 or 10 years; and, even in a good crop year, it is necessary to import 30 to 40 percent of Bizonia's requirements. The French zone can produce 2 or 3 million pounds in a favorable year. A small crop in western Germany was in prospect early in August 1948, and it was expected that 5 million pounds would have to be imported into Bizonia alone. Hungarian, Rumanian, Polish, and northern French seeds are preferred in western Germany.

During the 1946-47 season, 1,320,000 pounds of red-clover seed were exported from the United States to Germany, compared with the next largest export of 230,330 pounds to that country in 1933. The largest imports, 2,851,600 pounds, of this seed, from Germany into the United States, took place in 1922. Prior to World War II, Germany imported most of its red-clover seed from Rumania, Hungary, Latvia, Czechoslovakia, France, Poland, and Lithuania.

Hungary

As in the case of alfalfa, there has been a marked reduction in recent years in Hungary's acreage of red-clover seed, because of the division of the large estates by the Government. According to the Central Statistical Office, 129,000 acres of red clover were sown for all purposes in 1947, compared with about 350,000 acres 25 years ago. The Office of Planning proposed an acreage of 341,000 acres for hay, pasture, and seed for the 1948-49 season. The 1947 and 1948 seed crops were reported to be small by the Hungarian seed trade. During the 1939-43 period, production of red-clover seed ranged from 7,920,000 pounds in 1940 to 19,844,000 pounds in 1943 and averaged 11,422,000 pounds, compared with the 1932-38 average of 9,240,000 pounds.

Exports of red-clover seed for the 1939-43 period ranged from 2,271,-000 pounds in 1940 to 11,263,000 pounds in 1942 and averaged 6,504,000 pounds, compared with the 1934-38 average of 4,486,000 pounds. Eighty-five percent of the 1939-43 exports went to Germany, and the remainder went mostly to Denmark, Sweden, Italy, Switzerland, the Netherlands, and Bulgaria. During 1947, 7,787,000 pounds of alfalfa and red-clover seed were exported, the bulk going to Russia and the United Kingdom. Smaller quantities also went to Austria, Czechoslovakia, Sweden, and Switzerland. During the first 3 months of 1948, 1,151,000 pounds of alfalfa and red-clover seed were exported chiefly to Czechoslovakia, Russia, Austria, Poland, and Germany.

Italy

The 1948 production of red-clover seed in Italy was estimated at 4,015,000 pounds by the Central Institute of Statistics in Rome, compared with 3,805,000 pounds in 1947. The increased production of 1948 was due to a slightly larger acreage, as the yield of 250 pounds per acre was the same for both years. Most of the red-clover seed in Italy is obtained from small farms in the hilly sections, whereas alfalfa seed is obtained from larger farms in the valleys. The largest quantity ever imported from Italy into the United States was 7,808,900 pounds during the 1919-20 season. None has been exported from Italy to the United States during the past 23 years. Prior to 1939, exports, averaging nearly 1,500,000 pounds, went chiefly to Germany, France, and Yugoslavia.

Netherlands

The 1948 production of red-clover seed in the Netherlands was estimated at about 2,000 pounds, compared with 22,000 pounds in 1947 and 176,-000 pounds in 1946. Yields averaged 242 pounds per acre for the 3 years. Approximately 800,000 pounds of this seed were used in the Netherlands.

It was expected that about 880,000 pounds would be imported during the 1948-49 season, compared with 794,000 pounds during the preceding season. The largest quantity ever exported from the United States to the Netherlands was 565,000 pounds in 1942. Prior to 1939, average annual imports of approximately 1 million pounds came chiefly from Poland, the United Kingdom, Hungary, and Italy. Although the Netherlands has never produced a surplus of red-clover seed, the United States imported as much as 200,000 pounds from that country during the 1927-28 season.

Sweden

Sweden produced about 13 million pounds of red-clover seed in 1948, or approximately the same quantity as in 1947; but this crop was about 1 million pounds less than that of 1946. That country's annual requirements are estimated at 12,700,000 pounds.

In some years, Sweden's exports have exceeded her imports. During the 1930-39 period, imports, which came mainly from Poland, Germany, and Czechoslovakia, were about twice as large as exports. In 1942, 813,-500 pounds were imported from Hungary alone. In 1947, of the 397,490 pounds exported, 220,460 pounds went to Germany; 104,720, to Norway; 55,115, to Finland; 16,975, to Belgium; and 220 pounds, to other countries.

Switzerland

Production of red-clover seed in Switzerland is small, and it usually falls far short of meeting Swiss requirements. The 1947 crop of about 550,000 pounds was probably one of the largest ever produced and compares with the 1940-45 average of about 130,000 pounds. Prospects for the 1948 crop in mid-August were rather poor because of too much rain.

During the 1947-48 season, 120,000 pounds of red-clover seed were imported from the United States, 163,000 pounds (including some alfalfa) from Hungary, and 7,000 pounds from France. It was expected that 300,-000 pounds or more would be imported from Rumania during the 1948-49 season.

United Kingdom

The 1948 production of red-clover seed in the United Kingdom was unusually small--probably not in excess of 2,200,000 pounds, or about one-tenth of the large 1947 crop and one-fifth of the 1942-46 average. Usually, slightly more than nine-tenths of the total production is of medium red (early, double-cut, or broad) and one-tenth is of mammoth red (late-flowering or single-cut).

Chiefly because of the large 1947 crop, the carry-over into the 1948 crop year was about 50 percent above average. The carry-over plus the indicated 1948 production falls short of the estimated requirements of the United Kingdom by about 2 million pounds.

The United Kingdom was expected to import fairly large quantities of red-clover seed during the 1948-49 season. Figures with respect to imports of this seed during the 1947-48 season were not available, but imports were believed to be small because of the large 1947 crop. In the 1946-47 season, 6,950,000 pounds were imported, compared with an average of 3,614,000 pounds for the previous 5-year period. Of the 6,950,000 pounds imported in 1946-47, 2,792,000 pounds came from the United States. The largest quantity ever imported from the United States was 6,332,200 pounds in 1942. Prior to 1939, imports exceeded exports by about 1,500,000 pounds. Imports came chiefly from Canada, Poland, South America, the United States, France, and Germany.

Exports of clover seed (mostly red) from September 1, 1947, to August 31, 1948, were 8,492,000 pounds, compared with 7,753,000 pounds of red clover alone for the year ended June 30, 1947; 7,132,000 pounds for

1946, and none for the years 1943-45. Prior to 1939, exports went chiefly to Germany, France, Belgium, the Irish Free State, and Canada.

ALSIKE CLOVER

The total annual requirement of alsike-clover seed in the 12 countries visited is estimated at 10 to 15 million pounds. Sweden produces more of this seed than any of the other countries and apparently is the only one that normally produces a surplus. Poland and Latvia, neither of which were visited on this trip, have often produced surpluses but, since World War I, production in these two countries has been greatly curtailed. However, Latvia exported about 642,000 pounds to the United States in the 1936-37 season. In the summer of 1948 the production of alsike-clover seed in Europe was estimated to be below average and smaller than that of 1947.

Czechoslovakia

The 1948 production of alsike-clover seed in Czechoslovakia was not expected to exceed 300,000 pounds, compared with about 800,000 pounds in 1946 and 1,000,000 pounds in 1945.

About 25 years ago it was not uncommon for Czechoslovakia to export 1,000,000 pounds or more, chiefly to northern European countries. The largest quantity ever imported into the United States from Czechoslovakia was 285,500 pounds (including 11,000 pounds of Hungarian origin), during the 1937-38 season.

Denmark

In mid-July the 1948 acreage of alsike-clover seed in Denmark was officially forecast to be about 890 acres, compared with 1,400 acres in 1947 and 1,335 acres in 1946. With an estimated yield of 200 pounds per acre, a production of 178,000 pounds was indicated for 1948, compared with a normal production of about 250,000 pounds. It appears that Denmark usually produces a little less of this seed than it requires.

No alsike-clover seed was imported during the 1947-48 season, and none was expected to be imported during the following season. The largest quantity ever exported to the United States was 72,000 pounds, during the 1924-25 season. However, prior to 1939, Denmark imported about 500,000 pounds annually, mostly from Sweden, Latvia, Lithuania, and Canada.

Belgium

Production of alsike-clover seed in Belgium is usually very small. In a favorable year, about 100,000 pounds are produced. The 1948 production was estimated at one-half that quantity. Imports usually are around 200,000 pounds. During the 1945-46 season the United States Gov-

ernment furnished that country 46,950 pounds of alsike- and white-clover mixtures and 11,100 pounds during the preceding season.

Germany

Many years ago, Germany normally had a surplus of about 220,000 pounds of alsike-clover seed. The largest quantity ever imported from Germany into the United States was 216,200 pounds, during the 1921-22 season.

During the 1948-49 season, Bizonia was the destination of approximately 2,600,000 pounds from the United States, compared with 1,072,000 pounds during the preceding season. Prior to 1939, imports came chiefly from Latvia, Canada, and Sweden.

Sweden

Normally, Sweden produces approximately 4,000,000 pounds of alsike-clover seed and has an exportable surplus of about 600,000 pounds, which in the past went chiefly to Denmark and Germany. The 1948 crop was estimated at 1,100,000 pounds, compared with 3,968,000 pounds in 1947. The carry-over into the 1948 crop year, estimated at 500,000 pounds, was a little larger than the average carry-over.

During 1947, 733,200 pounds of alsike-clover seed were exported from Sweden. Of that quantity, 275,600 pounds went to Finland; 110,200 pounds each, to Denmark and Germany; 98,600 pounds, to Norway; 55,100 pounds each, to France and Austria; 11,000 pounds to Belgium; and 17,400 pounds to other countries. The largest quantity ever imported into the United States from Sweden was 176,400 pounds during the 1937-38 season.

United Kingdom

Production of alsike-clover seed in the United Kingdom is generally unimportant. During the 1942-46 period, it averaged only about 26,000 pounds. The requirements of this seed in that country are fairly large, ranging from 2.5 to 3.5 million pounds annually. For many years, the bulk of the imports came from Canada, with Poland the next largest source. However, during the past 7 years, much alsike-clover seed and mixtures of this seed and white-clover seed have been imported from the United States.

Exports of alsike-clover to the United Kingdom by the United States Government were 1,441,600 pounds during the 1941-42 season, 1,838,630 pounds in 1942-43, and 61,410 pounds in 1945-46. In addition to this seed, the United States shipped to the United Kingdom 783,920 pounds of alsike- and white-clover mixtures in 1941-42; 1,583,338 pounds, in 1942-43; 767,731, in 1943-44; 148,500, in 1944-45; and 210,089 in 1945-46. During the 1946-47 season, the United Kingdom was the destination of 1,859,000 pounds of alsike-clover seed from dealers in the United States.

WHITE CLOVER

The normal requirements of white-clover seed in the 12 European countries visited are estimated at approximately 10,000,000 pounds. Czechoslovakia, Denmark, the United Kingdom, and Hungary usually produce the greatest quantity. In prewar years, Poland and Lithuania produced relatively large quantities, but these countries were not included among those visited on this trip, and little is known about production there in recent years. The 1948 production in Europe was expected to be smaller than in 1947, and below average, chiefly because of rains in June and early July.

Czechoslovakia

It is probable that, for many years, Czechoslovakia led all other European countries, except Poland, in the production of white-clover seed. Prior to World War II, Czechoslovakia produced approximately 1,500,000 pounds of this seed. During the past 3 years, however, production has averaged only about 1,000,000 pounds.

During 1947, exports of white-clover seed from Czechoslovakia were only 187,000 pounds -- chiefly to Denmark, Germany, the United Kingdom, and Sweden -- compared with 1,737,000 pounds in 1937. In prewar years, when Czechoslovakia exported the major portion of her production, Germany received the bulk of the exports, with much smaller quantities going chiefly to the United Kingdom, France, the United States, Austria, and the Netherlands. The largest quantity ever exported to the United States was 327,800 pounds during the 1938-39 season.

Denmark

Production of white-clover seed in Denmark in 1948 was estimated at about 1,100,000 pounds, compared with 1,700,000 pounds in 1947. The marked decline from the crop of 1947 was due to a sharp reduction in acreage, inasmuch as the anticipated yield of 200 pounds per acre in 1948 was about equal to that of 1947.

Imports of white-clover seed normally exceed exports by about 300,000 pounds. In prewar years, these imports came chiefly from Poland and Lithuania. Because of the large 1947 crop, none of this seed was imported during the 1947-48 season, compared with 383,000 pounds in 1946 and the estimated imports of about 660,000 pounds during the 1948-49 season.

Germany

Production of white-clover seed in Bizonia in 1948, was expected to be small. In prewar years, the bulk of the German crop, normally about 500,000 pounds, was produced in Pomerania and Silesia.

It was estimated that the import of approximately 500,000 pounds of this seed would be necessary to meet Bizonia's 1948-49 requirements. Years ago, the whole of Germany probably imported in excess of 2,000,000 pounds annually.

Hungary

Production of white-clover seed in Hungary in prewar years probably averaged around 1,000,000 pounds. Because of the division of large estates by the Government, production has been only about half as much as that of former years.

During the 1930-39 period, approximately 500,000 pounds of white-clover seed were exported annually, chiefly to Germany, the United States, the Netherlands, and the United Kingdom. Exports were increased to about 1,000,000 pounds during the 1940-44 period. The largest quantity ever imported into the United States from Hungary was 428,900 pounds during the 1938-39 season.

Netherlands

Production of white-clover seed in the Netherlands is very small--usually less than 25,000 pounds. Imports are fairly large, averaging around 500,000 pounds. In prewar years, the chief sources of these imports were Poland, Hungary, Czechoslovakia, and Latvia. In recent years, however, the Netherlands has imported much white-clover seed from the United States. During the 1946-47 season, 269,000 pounds of clover seed (chiefly white) were exported to that country from the United States, compared with 431,000 pounds in 1945-46 and 238,000 pounds in 1944-45.

Sweden

The 1948 production of white-clover seed in Sweden was estimated at 176,000 pounds, compared with 275,000 pounds in 1947 and a normal crop of 220,000 pounds. Usually, Sweden imports about 100,000 pounds annually; and, prior to 1939, imports came chiefly from Lithuania, Poland, Denmark, and Germany. Because of the relatively large crops in 1946 and 1947, only about 22,500 pounds were imported in 1947 from Czechoslovakia, New Zealand, the United Kingdom, and Hungary.

United Kingdom

The 1947 production of different kinds or strains of white-clover seed, including wild white, in the United Kingdom was about 1,328,000 pounds, compared with the 1942-46 average of 1,020,000 pounds. As a rule, imports of this seed slightly exceed production.

During the 1946-47 season, imports were 2,325,000 pounds--more than twice as large as the 1942-46 average of 1,065,200 pounds. In prewar years, most imports came from Czechoslovakia, Poland, Australia, and Hungary.

LADINO CLOVER

Although a few dealers in Europe indicated that France and Hungary produced Ladino-clover seed, it would appear that Italy alone produces important quantities. In Italy, the 1948 crop was officially estimated at 1,157,000 pounds, compared with the above-average 1947 crop of 1,515,-000 pounds. This decreased production was due to reductions of about 10 percent in the acreage and of about 15 percent in the yield per acre. Yields reported for the 2 years averaged about 150 pounds, as compared with only about 75 pounds in the United States. This seed is produced chiefly in the extreme northern provinces of Lombardy and Piedmont. Harvest is said to begin in August and to continue into September.

The first recorded imports of Ladino-clover seed by the United States from Italy occurred in July 1947, when 28,200 pounds were imported. About 2 years before the United States had imported a small quantity from Canada. During the fiscal year ended June 30, 1948, 440,600 pounds were imported from Italy. Between July 1, 1948, and March 31, 1949, 369,700 pounds were imported from Italy and 100 pounds from Canada.

CRIMSON CLOVER

The 1948 production of crimson-clover seed in the principal producing countries of France, Hungary, and Italy was below average. This decrease in production was due to a reduction in acreage and to the June rains, when the crop was setting seed. France, with a normal surplus of 3 to 5 million pounds, was not expected to have more than 1.5 million pounds available for export during the 1948-49 season. Czechoslovakia, which sometimes has a surplus, expected to import seed from France. In Hungary, with the division of the large estates on which most of the clover seed was formerly produced and with the unfavorable weather for this seed in 1948, there was little prospect for any exports of crimson-clover seed during the 1948-49 season. Prior to World War II, Hungary exported 5 to 10 million pounds annually. Normally, the 12 countries visited sow approximately 11 million pounds of crimson-clover seed annually.

Czechoslovakia

The harvesting of the crop of crimson-clover seed in Czechoslovakia usually begins the last week of June. Production of crimson-clover seed in that country probably has averaged less than 500,000 pounds during the past few years.

Imports in recent years have exceeded exports. About 360,000 pounds were imported during the 1946-47 season from France and Italy, and none was exported. Between February and June 1948, about 487,000 pounds were imported, half of which came from France.

About 25 years ago, more than 1,000,000 pounds were exported in some years. Of the 1,200,000 pounds exported during the 1923-24 season, 416,-700 pounds (a record quantity) went to the United States, and most of the remainder was exported to Germany.

France

For many years, France has shared with Hungary its lead in Europe in the production of crimson-clover seed. The 1948 production was estimated at 4,400,000 pounds, or about the same as that of 1947, but this crop was below average and much smaller than the 1946 production of approximately 13,000,000 pounds.

It was estimated that about 1,500,000 pounds would be available for export during the 1948-49 season, compared with nearly 3,000,000 pounds during the 1947-48 season and 4,500,000 pounds in the 1946-47 season. During the 1947-48 season, about 2,200,000 pounds went to western Germany; 249,000, to Czechoslovakia; 143,000, to the United States (for reexport elsewhere); 66,000, to Austria; 59,000, to Belgium; 44,000, to Switzerland; and 22,000 pounds went to the Netherlands. During the 1946-47 season, about 2,200,000 pounds went to western Germany; 1,100,000, to Belgium; 506,000, to Austria; 440,000, to Czechoslovakia; and 198,000 pounds, to Switzerland.

Prior to the 1929-30 season, France was the chief source of imports of crimson-clover seed into the United States. Peak years, ended June 30), for these imports were 1920 (8,845,600 pounds), 1924 (5,218,300 pounds, and 1926 (4,955,900 pounds). Since June 30, 1939, there have been no imports of this seed from France.

Germany

Germany has never produced much crimson-clover seed, but it has always been a large consumer of it, importing about 4,500,000 pounds annually from Hungary, alone, prior to World War II. No other country in Europe has imported nearly so much of this seed as has Germany. The requirements of this seed in Bizonia during the 1948-49 season were estimated at about 3,000,000 pounds. In recent years, France and Hungary have been the chief sources of supply.

Hungary

Production of crimson-clover seed in Hungary has declined. The Government program in the fall of 1948 called for sowing fewer than 20,000 acres, or about one-third less than the acreage of 25 years ago. Production during the 1939-43 period averaged about 7,700,000 pounds. Harvesting of the crop usually begins about June 20.

Exports during the 1940-44 period averaged about 4,400,000 pounds, or about one-half as much as the average quantity exported during the preceding 10-year period. Prior to World War II, more than half of Hungary's exports went to Germany, and most of the remainder to the United States

and Italy. During the 5-year period July 1, 1935 to June 30, 1940, imports into the United States from Hungary were large, averaging 3,342,000 pounds, with a peak of 5,520,000 pounds in the 1936-37 season. None has been imported by the United States from Hungary since the first half of June 1940.

Italy

Italy usually produces about 2,000,000 pounds of crimson-clover seed, of which about one-half is generally available for export. Harvest begins at the end of June or early in July. The 1948 crop was expected to be smaller than the relatively large 1947 crop.

During the 1947-48 season a peak of 605,900 pounds was imported into the United States from Italy compared with 283,100 pounds during the preceding season.

United Kingdom

Production of crimson-clover seed in the United Kingdom has declined for a number of years, averaging about 150,000 pounds during the 1942-46 period. A below-average crop was in prospect for 1948. Usually, it is necessary to supplement domestic supplies with imports of 200,000 pounds or more. During the 1941-42, 1942-43, and 1944-45 seasons, 112,000, 199,950, and 112,000 pounds, respectively, were obtained from the United States under Lend Lease.

TREFOIL

The United Kingdom, France, and Denmark probably lead the other 12 countries visited in the production of yellow-trefoil (Medicago lupulina or black medic) seed. Poland was not included in this study, but in the past a relatively large quantity of this seed was produced there. Italy probably grows more birdsfoot-trefoil (Lotus corniculatus) seed than any other country in Europe, but France (and Rumania, which was not visited) produces important quantities of this seed. The 1948 production of trefoil seed was expected to be below average, but the carry-over was reported to be above.

Belgium

Production of yellow-trefoil seed in Belgium is usually small, and only about 100,000 pounds are grown in a favorable year. The 1948 crop was estimated at about 50,000 pounds. Normally, Belgium imports about 400,000 pounds of this seed, generally from Denmark, Sweden, and England, and about 50,000 pounds of birdsfoot trefoil.

Denmark

Production of yellow-trefoil seed in Denmark in 1948 was estimated

at 2,300,000 pounds, compared with an average production of about 3,000,000 pounds. Denmark's requirements during the 1947-48 season were about 1,900,000 pounds. Exports during the 1948-49 season were forecast at about 770,000 pounds. Prior to 1939, Denmark imported nearly as much of this seed as was exported. Imports came mostly from the United Kingdom and Luxembourg, and exports went chiefly to Germany, France, and the Netherlands.

France

Many years ago, an average of about 6,000,000 pounds of yellow-trefoil (minette) seed was produced in France. However, imports of this seed during the 1930-39 period averaged nearly 1,500,000 pounds. The United Kingdom was probably the most important source of the imports.

Production of birdsfoot-trefoil seed in France in 1948 was expected to be somewhat below average. Exports for the 1948-49 season were estimated at 1,300,000 pounds.

Italy

Italy probably produces more birdsfoot-trefoil seed than any other country in Europe. Its production averages about 1,600,000 pounds. The 1948 crop was expected to be about normal. This seed is usually harvested the latter part of August.

The first important exports of birdsfoot-trefoil seed to the United States occurred during the 1946-47 season, when 161,100 pounds were received in this country. In the following season, 233,100 pounds of seed of Italian origin were exported, but 43,900 pounds of that quantity went to the United States via the United Kingdom. Apparently all the birdsfoot-trefoil seed exported to the United States has been of the broadleaf type.

Netherlands

The Netherlands depends largely, if not entirely, upon imports to supply her annual requirement of 625,000 pounds of yellow-trefoil seed.

Sweden

It would seem from the quantities of yellow-trefoil seed exported and the quantities needed for its own planting requirements, that Sweden's production in recent years would considerably exceed the semiofficial estimate of 125,000 pounds annually. Prior to World War II, it exported about 70,000 pounds annually, chiefly to France and Denmark. During the 1947-48 season, Sweden exported 55,000 pounds to the United States.

United Kingdom

The United Kingdom probably leads other countries in Europe in the

production of yellow-trefoil seed. During the 1942-46 period, an average of about 5,500,000 pounds was produced. The 1948 production was expected to be less than the below-average crop of 3,000,000 pounds in 1947.

The largest quantity of this seed exported to the United States was 414,400 pounds, during the 1946-47 season, compared with 103,800 pounds during the preceding season.

VETCH

The 1948 production of vetch seed in the 12 countries visited was expected to be about average. It is estimated that the annual planting requirements of this seed in those countries approximate 85,000,000 pounds. Much more common vetch (Vicia sativa) than hairy-vetch (Vicia villosa) seed is planted in Europe. Of the 12 countries, France, Hungary, and Czechoslovakia probably lead in the production of vetch seed. Poland, Rumania, Turkey, Latvia, and Lithuania, which were not visited, also produce large quantities.

During the 1930-39 period, imports of hairy-vetch into the United States from Hungary, averaging 1,629,510 pounds, made up 55 percent of the total annual imports of that seed. Czechoslovakia, Latvia, Germany, and Poland, in that order, followed Hungary as the most important sources (origins) of these imports. Hungary, was likewise the most important source of the imports of common-vetch seed into the United States, providing an average of 350,920 of the 629,410 pounds imported annually during the 1930-39 period.

Austria

Much vetch seed is planted in Austria; but, apparently, there is seldom an exportable surplus. During the 1947-48 season, 5,703,000 pounds of common-vetch and 846,700 pounds of hairy-vetch seed were obtained from the United States Government, compared with 1,290,000 pounds of common vetch in the preceding season and 4,994,000 pounds of common and Willamette vetch in the 1945-46 season. Prior to 1939, Austria imported much vetch seed from Rumania.

Belgium

Practically no vetch seed is produced in Belgium. It was estimated that, during the 1948-49 season, that country would import about 4,500,000 pounds of common-vetch seed from Italy, Turkey, the United States, and other countries. During the 1945-46 season, Belgium obtained 879,560 pounds of Willamette-vetch and 340,000 pounds of mixed-vetch seed from the United States Government. Prior to World War II, Belgium imported much vetch seed from the Netherlands and Rumania.

Czechoslovakia

Although the 1948 crop of hairy-vetch seed in Czechoslovakia was indicated to be about average, some seed was expected to be imported from Poland and Hungary. The largest quantity of this seed ever imported from Czechoslovakia into the United States was 2,134,000 pounds (including 33,200 pounds of Hungarian origin) during the 1937-38 season, followed by 1,877,200 pounds in 1938-39. During the 1945-46 season that country obtained 1,252,960 pounds of common and 1,120,000 pounds of Willamette-vetch from the United States Government. Prior to 1939, Czechoslovakia imported much vetch seed from Rumania.

France

France produces much common-vetch seed but no true hairy vetch (Vicia villosa). The so-called large-seeded "winter" vetch in France is said to withstand fairly low temperatures. The 1948 production of vetch seed in France is estimated at 27,500,000 pounds, of which about 10,000,000 pounds were exported by about April 1, 1949. In the past, France imported fairly large quantities of vetch seed from Rumania, Lithuania, Latvia, and other countries.

Germany

Germany has never been a large producer of vetch seed but has imported large quantities. Bizonia's 1948-49 requirements were estimated at 5,500,000 pounds of hairy-vetch and 17,600,000 pounds of common-vetch seed. During the 1947-48 season, the United States, exported to Bizonia 685,700 pounds of hairy-vetch seed, 3,761,000 pounds of common-vetch, and 769,000 pounds of mixed-vetch seed. Early shipments of spring-vetch seed during the 1948-49 season, totaling 10,500,000 pounds, came from Rumania, Turkey, Italy, Hungary, the Netherlands, and France.

Hungary

Hungary normally is a large producer of vetch seed; however, the 1947 and 1948 crops were reported to be much below average. During the 1932-38 period, the production in that country averaged about 27,500,000 pounds, with yields of about 700 pounds per acre. The Hungarian Office of Planning recommended the planting of approximately 70,000 acres of hairy-vetch in the fall of 1948.

The largest quantity of hairy-vetch seed ever imported into the United States from Hungary was 4,115,600 pounds (plus 297,300 pounds of that origin exported by Germany) during the 1938-39 season, and the largest quantity of common-vetch seed imported into the United States from that country was 2,120,800 pounds during the 1937-38 season.

Italy

Italy, like Switzerland, plants practically no hairy-vetch seed. Production of common-vetch seed in Italy is said to be increasing, and the crop is now estimated at approximately 4,500,000 pounds. Prior to 1939, Italy imported much vetch seed from the Netherlands and Rumania.

United Kingdom

As a rule, imports of vetch seed into the United Kingdom greatly exceed production. The 1947 production of "spring" and so-called, winter-vetch seed, which apparently is similar to the common vetch grown in Oregon, was about 1,350,000 pounds, compared with about 2,460,000 pounds in 1946 and the 1942-46 average of 2,580,000 pounds.

The United States Government shipped to the United Kingdom 1,120,000 pounds of common-vetch seed during the 1941-42 season; 680,000 pounds of common and 1,560,000 pounds of Willamette vetch in 1943-44; 2,240,000 pounds of common and 2,120,000 pounds of Willamette vetch in 1944-45; and 1,120,000 pounds of common vetch in 1945-46. Prior to 1939, the United Kingdom imported much vetch seed from South America, Latvia, and Rumania.

TIMOTHY

Sweden is the only country in Europe that normally has an exportable surplus of timothy seed. That country produces about 15,000,000 pounds annually. Denmark is second in production, with around 1,000,000 pounds. About 25 years ago, Czechoslovakia and Poland frequently produced surpluses, as did Silesia, Saxony, and Thuringia in Germany.

During the prewar years 1934-38, exports of timothy seed to Europe from the United States averaged 1,905,000 pounds. Of that quantity, the United Kingdom was the destination of 1,356,000 pounds; the Netherlands, 152,000; France, 131,000; Eire, 109,000; Belgium, 79,000; Germany, 42,000; and Switzerland, 36,000 pounds. During the war years, 1940-44, exports to Europe from the United States averaged 5,146,200 pounds, destined as follows: the United Kingdom, 3,523,800 pounds; Russia, 825,600; Eire, 359,200; Sweden, 192,600; Switzerland, 175,800; France, 54,200; and the Netherlands, 15,000 pounds.

Despite prevailing high prices for timothy seed, exports from the United States to Europe during the period July 1, 1948, to February 28, 1949, were large--4,951,200 pounds. Of this quantity, the United Kingdom was the destination of 2,665,000 pounds; France, 675,200; Eire, 547,000; Germany, 438,400; Austria, 222,300; Netherlands, 180,000; Switzerland, 155,100; and Belgium and Luxembourg, 68,200 pounds.

Figure 4.--Loading grain on a small farm near Aschaffenberg, Germany. Note the different crops grown in narrow strips. (July 27, 1948.)

Figure 5.--Shocks of rye about 5 miles southwest of Frankfurt, Germany. The 1948 grain crops in western Germany were large. (July 27, 1948.)

Figure 6.--Weighing rye from test plots at a German experiment station near Grabau. (July 29, 1948.)

Figure 7.--Girls cross pollinating peas on the experiment station near Grabau, Germany. (July 29, 1948.)

REDTOP

Production of redtop seed in Europe is very small, Germany and Poland being about the only countries reported to have produced as much as 50,000 pounds in a single year.

During the war years 1940-44, the United States exports of redtop seed to European countries averaged 516,400 pounds. Destinations and quantities included the United Kingdom, 373,800 pounds; Russia, 46,400; Switzerland, 43,200; Sweden, 38,000; France, 10,600; and the Netherlands and Italy each, 2,200 pounds. During the past three seasons, 1945-46 to 1947-48, United States exports to Europe averaged 1,426,700 pounds, with quantities to individual countries as follows: the United Kingdom, 314,300 pounds; Sweden, 281,000; Germany, 220,700; France, 190,000; the Netherlands, 129,700; Switzerland, 119,300; Belgium and Luxembourg, 81,000; Czechoslovakia, 31,700; Norway, 29,000; Austria, 21,700; Eire and Russia, each 3,300; and Hungary 1,700 pounds. Between July 1, 1948, and February 28, 1949, such exports of redtop seed from the United States were 230,000 pounds to Germany, 60,000 to Switzerland, 41,000 to France, 13,000 to the Netherlands, and 4,000 pounds to Belgium and Luxembourg.

KENTUCKY BLUEGRASS

Kentucky bluegrass is not extensively used in Europe. Denmark is the only European country that frequently produces a small surplus of this seed. The 1948 Danish crop was estimated at 190,000 pounds, with an average yield of about 360 pounds per acre. Sweden's 1948 production, estimated at 60,000 pounds, was much above average.

During the war years 1940-44, United States exports of Kentucky-bluegrass seed to Europe averaged 999,400 pounds, as follows: the United Kingdom, 725,000 pounds; Sweden, 135,000; Russia, 95,000; France, 20,200; the Netherlands, 11,000; and Denmark and Switzerland, each 6,600 pounds.

During the past three seasons 1945-46 to 1947-48, such exports averaged 879,700 pounds, of which the Netherlands was the destination of 246,400 pounds, and exports to other countries averaging 32,000 pounds or more were: Sweden (155,700 pounds), Belgium and Luxembourg (114,000), Switzerland (98,300), France (90,300), Denmark (44,000), Norway (43,700), and Austria (32,000). Exports of Kentucky bluegrass July 1, 1948, to February 28, 1949, were 806,400 pounds. Of that quantity, Germany was to receive 423,500 pounds; France, 118,700; the Netherlands, 95,700; Switzerland, 65,000; Norway, 50,400; Belgium and Luxembourg, 50,100; and Eire, 3,000 pounds.

ORCHARD GRASS

The 1948 production of orchard-grass seed in Europe was about the same as for 1947, but the carry-over into the 1948 crop year was much

smaller than that of the preceding year, and much below the average. Hence, about August 1, 1948, supplies were much smaller than a year earlier, and also much below average.

Nearly all European countries depend upon Denmark as a source of most of their requirements of orchard-grass seed. The United Kingdom normally produces much of this seed, but its requirements are large. Sweden generally has a small surplus.

Danish seed sells at a premium; but, in the fall of 1948, the sale of this seed at a price about 30 percent higher than that of seed of United States origin was stimulated chiefly by the "softer" Danish currency and the scarcity of American dollars.

Denmark

Denmark grows a larger quantity of orchard-grass seed than any other country in Europe and is the chief source of supply for nearly all European countries. The 1948 production of orchard-grass seed in Denmark was estimated at 3,800,000 pounds, compared with 3,050,000 pounds in 1947 and the 1937-46 average of approximately 6,400,000 pounds. The sharp decline from the average production was due chiefly to a marked decrease in acreage. The Danish Government estimated that the equivalent of 7,630 acres were harvested in 1948, as compared with 12,720 acres in 1947, the 10-year average of 14,200 acres, and the record of 24,800 acres in 1922.

The 1948 yield was expected to be about 500 pounds per acre, compared with 240 pounds in 1947 and the 10-year average of about 450 pounds. Harvesting of orchard-grass seed in Denmark usually begins the latter part of July.

During the 1947-48 season, Denmark planted about 1,250,000 pounds of this seed. An estimated 3,000,000 pounds were in prospect for export during the 1948-49 season, compared with about 4,800,000 pounds in the preceding season. During the prewar period, 1930-34, an average of 6,305,000 pounds of orchard-grass seed was exported from Denmark. Of that quantity, 4,409,000 pounds went to the United Kingdom; 618,300, to Germany; 280,600, to Switzerland; 248,000, to France; 153,700, to Sweden; 111,600, to Australia; 95,900, to the United States; 78,300, to Austria; 67,400, to the Netherlands; 45,400, to Norway; 44,200, to New Zealand; 29,000, to Czechoslovakia; 24,000, to the Irish Free State; 21,900 each to Belgium and Russia; and the remainder was exported to about 15 other countries.

The largest quantity ever imported into the United States from Denmark was 2,533,200 pounds during the 1921-22 season. Since 1938-39, when 1,580,600 pounds were brought in, such imports into the United States have been small.

Germany

The quantity of orchard-grass seed grown in Germany is small, and its annual requirements are approximately 700,000 pounds. During the 1948-49 season, Bizonia obtained about 660,000 pounds of this seed from the United States Government. Normally, however, Germany depends upon Denmark as a main source of supply. During the 1930-34 period, an average of 618,300 pounds was imported from Denmark.

Sweden

The 1948 production of orchard-grass seed in Sweden was about 475,000 pounds, compared with 280,000 in 1947 and the prewar average of about 880,000 pounds. Although Sweden usually exports 100,000 to 200,000 pounds of this seed annually--principally to the United Kingdom--about 150,000 pounds are normally imported from Denmark.

United Kingdom

The 1948 production of orchard-grass seed in the United Kingdom was expected to be smaller than the 1947 crop of approximately 4,000,000 pounds, but it was larger than the 1942-46 average of approximately 2,500,000 pounds. The carry-over into the 1948 crop year was much smaller than the large carry-over a year earlier. During the 1942-46 period, the United Kingdom's requirements of orchard-grass seed were estimated at approximately 5,500,000 pounds annually.

Generally, the United Kingdom has depended largely upon imports from Denmark to augment its production. During the 1930-39 period, an average of about 4,236,000 pounds was imported from Denmark. But, between 1940 and 1945, most of this seed was imported from the United States, whence record quantities of 5,788,894 pounds, during the 1943-44 season, and 5,461,073 pounds, during the following season, were obtained under Lend-Lease.

MEADOW FESCUE

The 1948 production of meadow-fescue seed in Europe was somewhat smaller than the large 1947 crop. The decreased production, however, was more than offset by the large carry-over (about 3,200,000 pounds) into the 1948 crop year.

Denmark is the only large producer of this seed in Europe. The other countries, including Sweden which ranks next to Denmark, normally have to import meadow-fescue seed in order to meet their planting requirements. The total European requirements are estimated at approximately 7,000,000 pounds annually.

Austria

Austria's normal requirement of meadow-fescue seed is believed to be about 150,000 pounds, most of which is imported. During the 1947-48 season, it was the destination of 154,000 pounds exported by the United States Government and, during the 1930-34 period, imported an average of 72,900 pounds, annually, from Denmark.

Denmark

Denmark is the only important producer of meadow-fescue seed in Europe. The 1948 production was estimated at 5,331,000 pounds, compared with a crop of 6,766,000 pounds in 1947, which is believed to be the largest ever produced there, and the 1937-46 average of 5,666,000 pounds.

Official Danish estimates indicated that 8,730 acres were harvested in 1948, compared with a record of 14,110 acres in 1947 and the 1929-38 average of 6,480 acres.

Denmark's planting requirements of this seed are about 1,700,000 pounds. In recent years, 3 to 3.5 million pounds have been exported annually. This is a larger quantity than was formerly exported. During the 1930-34 period, an average of 2,025,400 pounds of this seed was exported. Of that quantity, Germany, with 993,000 pounds, received nearly one-half and the United Kingdom, with 268,900 pounds, obtained more than one-eighth of the total. The average quantities exported to other countries were: 147,100 pounds to Switzerland, 144,200 to the Netherlands, 89,100 to Sweden, 72,900 to Austria, 52,000 to Russia, 51,500 to Norway, 21,500 to Belgium, 19,700 to Finland, 11,600 to the Irish Free State, and smaller quantities to 16 other countries.

Germany

At one time, Germany produced a surplus of meadow-fescue seed. During the 1930-34 period, it imported an average of about 269,000 pounds from Denmark. Bizonia obtained about 1,800,000 pounds of seed of Danish and United States origins between July 1 and October 31, 1948.

Netherlands

The Netherlands produces only about 100,000 pounds of meadow-fescue seed annually, which is much less than its annual requirements of about 550,000 pounds. The average yield is about 620 pounds per acre.

During the 1945-46 season, the Netherlands was the destination of 110,200 pounds exported by the United States Government, compared with 33,200 pounds in the preceding season. During the 1930-34 period, the Netherlands imported an average of 144,200 pounds from Denmark.

Sweden

The 1948 production of meadow-fescue seed in Sweden was estimated at 728,000 pounds, compared with 617,000 pounds in 1947 and a normal production of about 440,000 pounds. As a rule, it has been necessary for Sweden to import about 110,000 pounds from Denmark.

United Kingdom

The United Kingdom produces only 25,000 to 50,000 pounds of meadow-fescue seed annually, hence, has to depend almost entirely upon imports to supply its annual requirement of about 675,000 pounds.

During the 1930-34 period, imports from Denmark averaged 269,000 pounds. Between July 1, 1941, and June 30, 1945, exports to the United Kingdom from the United States under Lend Lease were: 472,360 pounds during the 1941-42 season; 514,000, in the 1942-43 season; 500,313, in 1943-44; and 591,998, in 1944-45.

RYEGRASS

Ryegrass is the most important of the forage grasses grown in Europe. The annual requirements of ryegrass seed in the 12 countries visited are estimated at approximately 90,000,000 pounds. The 3 chief kinds grown in Europe are perennial or English ryegrass (Lolium perenne), Italian ryegrass (Lolium multiflorum), and Westerwold ryegrass (Lolium multiflorum woldicum).

The 1948 production of ryegrass in the countries visited was expected to be smaller than that of 1947, but the carry-over into the 1948 crop was reported to be larger than usual. The United Kingdom, Denmark, France, and the Netherlands lead in the production of this seed.

Belgium

Production of ryegrass seed in Belgium is very small. It was estimated that, during the 1948-49 season, about 220,000 pounds of Italian-ryegrass seed and 440,000 pounds of perennial-ryegrass seed would be imported. During the 1944-45 season, 503,100 pounds of ryegrass seed were obtained from the United States Government, compared with 281,740 pounds in the following season.

Denmark

Denmark ranks next to the United Kingdom as the largest producer of ryegrass seed in Europe. The 1948 production of perennial-ryegrass seed in that country was estimated at 11,740,000 pounds, compared with 6,120,000 pounds in 1947 and the 1941-45 average of 13,268,000 pounds. The 1948 production of Italian ryegrass was estimated at 3,950,000 pounds,

compared with about 750,000 pounds in 1947 and the 5-year average of 9,128,000 pounds.

The exportable surpluses from the 1948 crop were estimated at 5,500,000 pounds of perennial and 2,000,000 pounds of Italian ryegrass, compared with exports of about 4,000,000 and 2,200,000 pounds, respectively, during the 1947-48 season. The largest quantity of Italian-ryegrass seed ever imported into the United States from Denmark was 802,600 pounds during the 1937-38 season, while the largest quantity of perennial-ryegrass seed imported from that country was only 96,800 pounds, also in 1937-38.

France

As a rule, France produces a small surplus of Italian-ryegrass seed. The 1948 production is estimated at approximately 5,000,000 pounds. This seed is more awned than the Irish and Danish seed, and it often sells at a premium over other origins. The largest quantity of Italian-ryegrass seed ever imported into the United States from France was 406,400 pounds, during the 1923-24 season.

During the 1948-49 season (up to April 1, 1949), about 3,300,000 pounds of ryegrass seed have been imported by France. The bulk of this seed came from Denmark and New Zealand, and smaller quantities were imported from the Netherlands and the United Kingdom. In the 1944-45 season, France obtained 1,101,600 pounds of common-ryegrass seed from the United States Government, while it obtained 1,080,981 pounds of perennial ryegrass the following season.

Germany

Bizonia's requirements of ryegrass seed were estimated at about 4,300,000 pounds, the larger portion being of Italian or common ryegrass. The perennial-ryegrass seed was expected to come mainly from Denmark and the United Kingdom; Italian ryegrass, from the United Kingdom; common ryegrass, from the United States; and Westerwold ryegrass, from the Netherlands.

Italy

Normal production of ryegrass seed in Italy is about 1,800,000 pounds; but, in recent years, the production has been only about one-third that quantity.

Netherlands

The 1948 crop of all kinds of ryegrass seed in the Netherlands amounted to about 1,850,000 pounds, compared with 4,270,000 pounds in 1947 and 3,110,000 pounds in 1946. An average of 2,010,000 pounds of Westerwold-

ryegrass seed was harvested in these 3 years, compared with 820,000 pounds for perennial and 250,000 pounds for Italian. An average of about 3,160,000 pounds of these seeds was planted in the Netherlands during the 3 years, which made it necessary to import, on an average, about 1,606,000 pounds of perennial and 423,000 pounds of Italian-ryegrass seed. During the 1944-45 season, 1,290,556 pounds of ryegrass seed were shipped to the Netherlands by the United States Government. Exports from the Netherlands during the 1946-47, 1947-48, and 1948-49 seasons consisted almost entirely of Westerwoldand averaged about 650,000 pounds.

Sweden

The 1948 production of perennial-ryegrass seed in Sweden, estimated at 1,100,000 pounds, was nearly twice as large as the 1947 crop and about 70 percent larger than prewar production. In 1947 and 1948, almost no Italian-ryegrass seed was produced, although, in prewar years, the average was approximately 175,000 pounds. Normally, it is necessary for Sweden to import about 165,000 pounds of ryegrass seed--usually from Denmark--to take care of its requirements.

United Kingdom

The United Kingdom probably produces more ryegrass seed than the rest of Europe combined. The 1948 production estimated at about 34,000,000 pounds, was below average and compares with 48,300,000 pounds in 1947 and the 1942-46 average of 54,700,000 pounds. The largest reduction from the 1947 crop was in perennial ryegrass, the 1948 production being only about 19,000,000 pounds, compared with approximately 31,000,000 pounds in 1947 and the average of 32,000,000 pounds. The 1948 production of Italian-ryegrass seed was estimated at 10,900,000 pounds, compared with 12,700,000 in 1947 and the average of 13,800,000 pounds. Although the United Kingdom normally has an exportable surplus, it usually imports some seed. During the 1941-42 season, for example, the United Kingdom was the destination of 1,200,000 pounds of ryegrass seed shipped by the United States Government. The largest quantity imported into the United States from the United Kingdom was 2,088,700 pounds during the 1925-26 season. Most of this quantity originated in northern Ireland, where the bulk of the United Kingdom crop is grown.

SUGAR BEET

The 1948 production of sugar-beet seed in Europe was expected not only to be much large than that for 1947 but also to exceed production in any other recent year. Deficits in a few countries, notably Czechoslovakia, Austria, and Hungary, will be more than offset by surpluses in others, particularly the Netherlands and Denmark.

In the summer of 1948, it was thought that France, probably the largest user of sugar-beet seed, would have to import some of it, but it appeared later that the 1948 crop was larger than expected.

In Europe, a small acreage of sugar beets is being planted with segmented seed, but the acreage planted with pelleted seed is rather insignificant because of the relatively high price of this seed and also because European farmers are reluctant to change planting practices.

Imports of sugar-beet seed from Europe into the United States have been nil since 1940, when 781,000 pounds were received. The last year of large imports of this seed into the United States was 1939, when 8,243,000 pounds were received. On the other hand, during the 1946-47 and 1947-48 seasons, Europe imported much sugar-beet seed from the United States. In the former season, of the 8,719,000 pounds exported to Europe by the United States, the largest quantities went to Hungary. Czechoslovakia, the Netherlands, and Yugoslavia. In the 1947-48 season, most of the 9,578,000 pounds exported to Europe went to Poland and Danzig, Czechoslovakia, Germany, Austria, and Italy. Between July 1, 1948, and March 31, 1949 the United States exported 2,078,528 pounds to Spain and 400,000 pounds to Austria.

Austria

Apparently Austria seldom, if ever, produced much sugar-beet seed. However, since 1945, the Government has urged farmers to increase their acreage for seed production. In the spring of 1948, seed was offered by the Government at about half price, and many farmers planted despite the drought that was then prevailing. Had it not been for the spoilage of many stecklings during the unusually mild 1947-48 winter, production of seed in 1948, estimated at 330,000 pounds, probably would have been twice as large. A production of at least 660,000 pounds in 1949 is forecast.

During 1947, about 800,000 pounds of sugar-beet seed were imported into Austria. About 55 percent came from France and nearly all of the remainder came from the Netherlands, Sweden, and Czechoslovakia. Imports during the 1948-49 season were expected to be about 2,500,000 pounds. Austria was the destination of 400,000 pounds of sugar-beet seed from the United States in November 1948--about the first recorded exports of this seed to Austria.

Czechoslovakia

The total 1948 acreage of sugar beets in Czechoslovakia was estimated at 180,000 acres, of which only about 4,000 acres were expected to be harvested for seed, compared with a normal acreage of 6,500 to 7,500 acres for seed. In 1948, only about 4,000 of the 180,000 acres of sugar beets were planted with segmented seed. However, results with this seed have been very good, but short age of segmenting machines and reluctance of

Czech farmers to adopt modern methods have delayed the wider use of segmented seed. The use of pelleted seed is only in the experimental stage. Better results are reported with pelleted seed imported from the United States than with seed processed in Czechoslovakia.

In Czechoslovakia, European-grown sugar-beet seed is usually planted in February and early March, but American-grown seed is not planted until the middle or latter part of March in order to minimize "bolting."

The 1948-49 planting requirements in Czechoslovakia, and possibly the 1949-50 requirements, are expected to exceed the domestic production of this seed. It is estimated that during the 1948-49 season about 1,500,000 pounds will have to be imported. This is much smaller than the 2,148,000 pounds exported to Czechoslovakia from the United States alone during the 1946-47 season and also smaller than the 1947-48 exports of 1,947,000 pounds to that country from the United States. Prior to World War II, Czechoslovakia produced a surplus of sugar-beet seed. During the 1934-38 period, exports to the United States averaged 1,027,000 pounds.

Denmark

The 1948 Danish crop of sugar-beet seed for planting beets from which sugar is to be extracted was estimated at 6,370,000 pounds. This compares with a near failure in 1947 and approximately 3,000,000 pounds in 1946. In addition, about 2,240,000 pounds of sugar-beet seed were produced for planting beets for fodder, compared with about 50,000 pounds in 1947 and about 1,500,000 pounds in 1946. The yield of sugar-beet seed in Denmark is ordinarily about 1,500 pounds per acre.

Because of the near failure of the 1947 crop of sugar-beet seed, the carry-over into the 1948 crop year was very small, and the exports during the 1947-48 season were only about 100,000 pounds. The 1948-49 exports of this seed were expected to be about 1,000,000 pounds for the production of beets for fodder and 3,000,000 pounds for the production of beets for sugar.

The last exports of sugar-beet seed to the United States occurred in 1939 when 1,123,000 pounds were exported, compared with average exports of 563,000 pounds during the 1934-38 period.

Little or no segmented seed is planted in Denmark because the weather is often bad after planting, which would result in too many skips if only one (segmented) seed instead of a cluster were planted at one spot.

France

The 1948 production of sugar-beet seed in France is estimated at 15,500,000 pounds, compared with 12,500,000 pounds in 1947 and the 1944-46 average of 10,711,000 pounds. Although the 1948 crop was above average, little or no seed was expected to be exported because most of it will be required to plant the 865,000 acres forecast for 1949.

In recent years, France has exported small quantities of sugar-beet seed. Between July 1, 1948, and February 28, 1949, about 900,000 pounds were exported to Belgium, Italy, Spain, and a few other countries.

During the 1945-46 season, France was the destination of 663,000 pounds exported from the United States, compared with 1,000 pounds in the 1946-47 season, less than 500 pounds in 1947-48, and none between July 1, 1948, and March 31, 1949.

Germany

Late in July 1948, reports indicated a fairly good crop of sugar-beet seed in Bizonia but a short crop of fodder-beet seed. Traditionally, the area of Germany in the Russian zone led most, if not all, European sections in the production of sugar-beet seed. In 1939, the United States imported 3,707,000 pounds from Germany, and during the 1934-38 period such imports averaged 8,220,000 pounds.

Hungary

The 1948 acreage of sugar-beet seed in Hungary was estimated at 3,700 acres, which probably represented an increase over that of recent years. Ordinarily, the yield of this seed is about 1,200 pounds per acre. If acreage and yield per acre were as reported, approximately 4,500,000 pounds of seed were produced in 1948.

During the 1946-47 season, Hungary was the destination of 2,848,000 pounds of sugar-beet seed from the United States, compared with 72,000 pounds in the following season and none between July 1, 1948, and March 31, 1949.

Netherlands

In 1948, the Netherlands probably produced more sugar-beet seed than any other country in Europe. Its production was officially estimated at 16,100,000 pounds, compared with 5,950,000 pounds in 1947 and 6,350,000 pounds in 1946. The indicated 170 percent increase in production over the 1947 figure was due almost entirely to a larger acreage, as 1948 yields were expected to exceed only slightly the large yields of 1947.

Inasmuch as the Netherlands consumes only about 1,600,000 pounds annually, 1948-49 exports were expected to be about 13,230,000 pounds, compared with 5,033,000 pounds during the 1947-48 season and 5,498,000 pounds in the 1946-47 season.

In 1939, the United States imported 1,667,000 pounds of sugar-beet seed from the Netherlands, compared with an average of 239,000 pounds during the 1934-38 period. But during the 1946-47 season, the Netherlands was the destination of 1,094,000 pounds from the United States, compared with none during the following season.

Figure 8.--Oats, barley, fodder beets, and farm woodlot on a small German farm near Frankfurt. (July 27, 1948.)

Figure 9.--Harvesting grain near Slany (northwest of Prague), Czechoslovakia. (August 1, 1948.)

Figure 10.--Individual plant selections on the trial grounds of a large French seedsman near Paris. (August 26, 1948.)

Figure 11.--Mr. Edler (center) with an Italian seedsman on the later's farm near Bologna, Italy. (August 21, 1948.)

The increase in production of fodder-beet seed in the Netherlands over that of each of the preceding 2 years was even more marked than the increase in sugar-beet seed production. The 1948 production of fodder-beet seed was estimated at 6,614,000 pounds, compared with 1,323,000 pounds in 1947 and 1,521,000 pounds in 1946. It was estimated that approximately 2,200,000 pounds of this seed would be available for export during the 1948-49 season.

VEGETABLE SEEDS

Generally speaking, the production of biennial vegetable seeds in Europe was expected to be larger in 1948 than in 1947 because of heavy losses of roots and heads during the severe 1946-47 winter. These were to produce the 1947 crop of seed. Until about mid-July of 1948, cold, wet weather in several important vegetable-seed areas tended to make it difficult to plant certain crops and caused unfavorable conditions for the production of vegetable seeds. However, the weather settled about July 20, and the majority of crops were harvested under rather favorable conditions.

In the fall of 1948, above-average crops of Brussels sprouts, cabbage, cauliflower, kale, kohlrabi, parsley, and radish were anticipated, but below-average crops of beans, beet, carrot, yellow onion, peas, and turnip seed were in prospect.

The carry-over of nearly all vegetable seeds into the 1948 crop year in Europe was reported to be below average.

Because the 1948 acreage of vegetable-seed crops in Bizonia was twice the 1947 acreage and because growing conditions were favorable during the summer, it appeared that less vegetable seed would have to be imported into Bizonia in 1948 than in the preceding year.

The accompanying tables give (1) the English, Latin, French, and German names of 48 kinds of vegetable seeds; (2) estimated 1948 acreage of important vegetable seeds in Denmark, Bizonia, Netherlands, United Kingdom, and the United States; and (3) imports of various vegetable seeds into the United States, by countries, 1934-40 average (where available), 1946-47 and 1947-48 seasons, and July 31, 1948, to March 31, 1949.

Austria

Early in August, it appeared that there would be an important deficit of garden-beet seed in Austria but that imports of other vegetable seeds would be relatively small. During the 1947-48 season, the United States Government shipped to Austria 120,790 pounds of mangel-beet seed, 43,600 of carrot, 11,000 of heading lettuce, 367,000 of smooth peas, 19,400 of rutabaga, 44,000 of spinach, and 297,895 pounds of turnip seed. Shipments of vegetable seeds to Austria from the United States Government were much larger during the 1945-46 season. They totaled

TABLE 2.- *Names of vegetable seeds in English, Latin, French, and German*

ENGLISH	LATIN	FRENCH	GERMAN
Broad beans	Vicia faba	Fèves des marais	Puffbohnen
Dwarf or bush beans	Phaseolus vulgaris nanus	Haricots nains	Buschbohnen
Lima beans	Phaseolus lunatus macrocarpus	Haricots de Lima	Limabohnen
Pole beans	Phaseolus vulgaris communes	Haricots à rames	Stangenbohnen
Garden beet	Beta vulgaris	Betterave potagère	Roterübe
Mangel beet	Beta vulgaris alba	Betterave fourr agère	Runkeln
Broccoli	Brassica oleracea italica	Chou-Brocoli	Broccoli
Brussels sprouts	Brassica oleracea gemmifera	Choux de Bruxelles	Rosenkohl
Cabbage	Brassica oleracea capitata alba	Chou blac	Weisskohl
Chinese cabbage	Brassica pekinensis	Chou de Chine	Chinakohl
Red cabbage	Brassica oleracea capitata rubra	Chou rouge	Rotkohl
Savoy cabbage	Brassica oleracea capitata sabanda	Chou frisé de Milan	Wirsingkohl
Carrot	Daucus carota	Carotte	Gartenmohre
Cauliflower	Brassica oleracea botrytis	Chou-fleur	Blumenkohl
Celery	Apium graveolens dulce	Céleri	Sellerie
Celeriac	Apium graveolens, rapaceum	Céleri-rave	Knollensellerie
Swiss chard	Beta vulgaris cicla	Bette poirée	Beisskohl
Chicory	Cichorium intybus	Chicorée	Zichorie
Collerd	Brassica oleracea acephala	Chou	Junge-Kohl
Sweetcorn	Zea mays saccharata	Mais sucré	Zuckermais
Cress	Lepidium sativum	Cresson	Gartenkresse
Cucumber	Cucumis sativus	Concombre	Gurke
Dill	Anethum graveolens	Aneth	Gartendill
Eggplant	Solanum melongena esculentum	Aubergine	Eierpflanze
Endive	Cichorum endivia	Chicorée endive	Endivie
Kale	Brassica oleracea acephala	Chou frisé	Blätterkohl, Grünkohl
Kohlrabi	Brassica oleracea gongylodes	Chou-rave	Kohlrabi
Leek	Allium porrum	Poireau	Porree, Lauch
Heading lettuce	Lactuca sativa capitata	Laitue pommee	Kopfsalat
Leaf lettuce	Lactuca sativa longifolia	Alfange	Schnittsalat
Romaine lettuce	Lactuca scariola longifolia	Laitue romaine	Bindsalet
Muskmelon	Cucumis melo	Melon cantaloup	Melonen
Mustard	Brassica juncea	Moutarde	Senf
Okra	Habiscus esculentus	Gombo	Ocher
Onion	Allium cepa	Oignon	Zwiebel
Parsley	Petroselinum hortense	Persil	Petersilie
Parsnip	Pastinaca sativa	Panais	Pastinake
Peas	Pisum sativum	Pois	Gartenerbsen
Pepper	Capsicum frutescens	Piment	Pfeffer
Pumpkin	Cucurbita pepo	Potiron	Gartenkürbis
Radish	Rapnanus setivus radicula	Radis	Radieschen
Rutabaga	Brassica napobrassica	Chou-navet	Kohlrübe
Salsify	Tragopogon porrifolius	Salsifis	Bocksbart
Spinach	Spinacia oleracea	Spinard	Spinat
Squash	Cucurbita maxima	Courge à la moelle	Speisekürbis
Tomato	Lycopersicon esculentum	Tomate	Tomate
Turnip	Brassica rapa	Navet	Rübe
Watermelon	Citrullus vulgaris	Melon d'eau	Wassermelone

TABLE 3.- *Vegetable seeds: Estimated 1948 acreage in Denmark, Bizonia, the Netherlands, the United Kingdom, and the United States*

SEED	DENMARK[1]	GERMANY (BIZONIA)	NETHERLANDS[2]	UNITED KINGDOM	UNITED STATES
Beans, broad		225	2,840	3,400	
dwarf	115	4,960	7,030	200	33,462
pole and runner		320	1,730	1,800	6,283
Beet, garden	110	1,060	260	700	1,312
Broccoli				180	118
Brussels sprouts	30	270	75	200	9
Cabbage	560	1,240	650	650	1,151
Carrot, garden	470	1,565	585	200	2,890
Cauliflower	140	45	370	40	196
Celery		30	20	20	41
Chard		25		70	99
Chicory			100		60
Cress	35	120	165	340	
Cucumber	120	1,770	35		4,393
Dill	20		85		30
Endive		10	5		164
Kale	75	285	140	50	58
Kohlrabi	70	750		20	28
Leek	50	95	5	80	4
Lettuce, heading		140	15		2,931
leaf	65	20		50	448
other		90			244
Onion		255	620	300	1,369
Parsley	60	125	7	90	109
Parsnip	7		15	250	36
Peas, garden	160	18,305	3,830	13,600	84,194
Pumpkin		545			292
Radish	265	3,545	1,360	600	2,176
Salsify (Scorzonera)	55	30	20		8
Spinach	1,050	2,995	4,950	660	554
Squash				200	2,055
Tomato		75	7	40	7,998
Turnip, garden	40	905	740	650	2,328

[1] 1937-46 average.

[2] Computed by dividing 1947 or 1942-46 average production figures by estimated yields per acre.

Source: Bureau of Agricultural Economics.

TABLE 4.- *Vegetable seeds: Imports into the United States, by countries, average 1934-40 annually 1946-47, 1947-48, and July 1, 1948, to Mar. 31, 1949, year beginning July 1*

[In pounds]

COUNTRY FROM WHICH IMPORTED	1934-40 AVERAGE	1946-47 SEASON	1947-48 SEASON	JULY 1,'48- Mar. 31,'49
	Beet, except sugar			
Denmark.....	8,088	0	200	90
France.....	22,902	322	485	0
Italy.....	1,025	70	194	278
Netherlands...	184,578	285	252	1,203
Sweden.....	0	10,229	0	0
United Kingdom	27,629	232	0	0
Canada.....	[1] 745	3,689	9,177	14,254
Other countries	[1] 6,654	300	0	0
Total.....	251,621	15,127	10,308	15,825
	Cabbage			
Denmark.....	122,755	35,137	7,898	22,026
Netherlands...	201,168	10,956	2,215	24,472
United Kingdom	8,622	0	0	0
Canada.....	0	148	[2] 5,643	3,670
Japan.....	10,243	0	204	113
Other countries	[3] 3,162	448	51	20
Total.....	345,950	46,689	16,011	50,301
	Carrot			
Denmark.....	2,911	1,610	0	8
France.....	2,557	522	5	
Netherlands...	5,947	68	80	5
Canada.....	10	39,985	53,640	723
Other countries	660	650	0	
Total.....	[4] 12,085	42,835	53,725	736

COUNTRY FROM WHICH IMPORTED	1934-40 AVERAGE	1946-47 SEASON	1947-48 SEASON	JULY 1,'48 - Mar. 31,'49
	Cauliflower			
Denmark.....	7,748	1,658	559	682
Netherlands...	5,496	5,891	3,154	3,597
Other countries	866	59	45	193
Total.....	14,110	7,608	3,758	4,472
	Kale			
Denmark.....	2,158	747	800	2,335
Netherlands...	55,210	4,516	1,796	19,846
Other countries	564	52	503	2,020
Total.....	57,932	5,315	3,099	24,201
	Kohlrabi			
Denmark.....	632	508	337	3,774
France.....	1,903	0	1,120	100
Italy.....	5,300	0	0	
Netherlands ..	5,028	628	1,527	654
Other countries	[5] 3,196	71	83	0
Total.....	16,059	1,207	3,067	4,528
		Onion		
France.....	6,583	2,685	2,549	1,065
Italy.....	8,654	1,873	357	400
Netherlands...	9,219	5,062	5,185	5,482
Spain.....	2,790	0	11,175	0
Canada.....	0	2,698	12,673	2,171
Canary Island	152,602	89,691	53,862	54,015
Mexico.....	0	2,822	2,998	0
Other countries	[6] 23,676	0	26	2,301
Total.....	176,524	104,831	88,825	65,434

See footnotes at end of table.

TABLE 4.- *Vegetable seeds: Imports into the United States, by countries, average 1934-40 annually 1946-47, 1947-48, and July 1, 1948, to Mar. 31, 1949, year beginning July 1*
[In pounds] Cont.

COUNTRY FROM WHICH IMPORTED	1934-40 AVERAGE	1946-47 SEASON	1947-48 SEASON	JULY 1, '48-MAR. 31, '49
	Parsley			
Denmark	338	900	518	0
France	58,985	302	0	0
Italy	547	613	709	320
Netherlands	6,802	1,712	441	20
Other countries	[7] 113,452	14	68	32
Total	80,124	3,541	1,736	372
	Parsnip			
France	3,164	0	0	0
Netherlands	5,183	100	510	508
United Kingdom	1,751	0	0	0
Canada	0	16	0	4,130
Other countries	383	0	0	0
Total	10,481	116	510	4,638
	Pepper			
France	531	0	0	0
Italy	203	0	1,102	66
Netherlands	460	0	5	0
Canada	0	331	45	0
Mexico	0	0	0	324
Other countries	134	0	12	23
Total	1,328	331	1,164	413
	Radish			
Denmark	9,061	1,709	2,357	3,000
Netherlands	516,698	31,858	97,230	165,988
United Kingdom	17,806	0	1,040	0
Canada	93	5,693	7,528	2,822
Japan	[8] 7,611	0	4,110	2,172
Other countries	[4] 13,041	30	28	210
Total	564,310	39,290	112,293	174,192
	Rutabaga			
Denmark	8,818		0	7,687
Netherlands	24,867	5,415	2,730	5,631
United Kingdom	18,577			
Canada		3,820	8,216	822
Other countries	1,402	10	0	0
Total	[4] 53,664	9,245	10,946	14,140
	Spinach			
Denmark	166,265	92,524	19,382	38,550
Netherlands	2,332,337	2,066,148	1,685,660	1,073,801
Other countries	[9] 43,312	6,808	2,120	1,891
Total	[4] 2,541,914	2,165,480	1,707,162	1,114,242
	Turnip			
Denmark	6,081	0	0	400
Netherlands	133,400	863	933	14,446
United Kingdom	350,756		42,045	64,836
Canada	153	4,582	205	83
Japan	85,817			75
Other countries	2,991	167	5	192
Total	[4] 579,198	5,612	43,188	80,032

[1] Includes 2,773 pounds from Germany and 3,117 pounds from Japan.

[2] 4,244 pounds, U. S. Seed returned.

[3] Includes 2,134 pounds from France.

[4] 1936-40 average.

[5] 2,142 pounds from United Kingdom and 994 pounds from Japan.

[6] Includes 6,079 pounds from Germany, 6,961 pounds from United Kingdom, and 6,532 pounds from Japan.

[7] Includes 9,725 pounds from Belgium, 1,510 pounds from Germany, and 1,209 pounds from United Kingdom.

[8] Includes 2,312 pounds from France, 3,518 pounds from Germany, and 5,553 pounds from Hungary.

[9] Includes 26,681 pounds from United Kingdom, 3,215 pounds from France, 5,732 pounds from Hungary, and 6,823 pounds from Japan.

Compiled from Foreign Commerce and Navigation of the United States and official records, Bureau of Foreign and Domestic Commerce.

2,120,671 pounds and consisted of garden beans (1,101,535 pounds), garden beet (159,342), Brussels sprouts (660), cabbage (4,262), carrot (130,801), cauliflower (4,805), celery and celeriac (1,335), Swiss chard (3,158), cucumber (23,161), endive (1,320), leek (4,470), lettuce (10,626), onion (6,750), parsley (4,400), peas (619,960), pumpkin (4,420), radish (19,595), rutabaga (6,258), spinach (3,138), tomato (4,410), and turnip seed (6,265 pounds).

Belgium

Belgium produces some beans, chicory, peas, salsify, and spinach seed. A few of the dealers in that country reported that, in the past, they obtained cucumber, sweetcorn, and watermelon seed from the United States; peas and turnip from the United Kingdom; carrot, leek, lettuce, onion, and peas from France; cabbage and cauliflower from Denmark and the Netherlands, as well as radish from the latter; and eggplant, pepper, and tomato seed from Italy.

Denmark

Denmark is an important producer of Brussels sprouts, cabbage, cauliflower, kale, kohlrabi, parsley, and spinach seed. Generally speaking the production of the seed of root crops in Denmark in 1948 was much larger than the relatively small crop in 1947, occasioned by the great losses of roots during the severe winter of 1946-47. The 1948 acreage of some of the Danish seed crops was below average; but, in most cases, average, or larger, yields per acre were expected in mid-September. By that time, nearly all vegetable seeds, except notably carrot and radish, had been threshed. Most of the threshing had been done under favorable weather conditions.

The 1948 production of Brussels sprouts seed in Denmark was expected to be fully equal to the 1946 production of 24,000 pounds and much larger than the 1937-46 average of 13,900 pounds.

Production of garden-beet seed, estimated at 60,000 pounds, was about the same as the 1946 crop but 7,000 pounds less than the 10-year average. During the 1934-40 period, an average of 8,088 pounds of beet seed other than sugar beet was imported into the United States from Denmark. During the 1947-48 season, the United States exported 11,000 pounds to Denmark, compared with 6,000 pounds during the preceding season.

The estimated production of 300,000 pounds of cabbage seed was much larger than the 1946 crop of 215,000 pounds or the average crop of 234,300 pounds. Yields per acre of the various types of cabbage seed, except red, were large. During the 1936-40 period, an average of 122,755 pounds of cabbage seed was imported from Denmark into the United States. However, in recent years, exports to the United States have been relatively small, only 5,698 pounds of Danish origin being exported during the 1947-48 season, compared with 35,137 pounds during the preceding season.

Much of the garden-carrot seed did not come up in 1948, but the yield per acre was expected to be well above normal. The estimated production of about 100,000 pounds is larger than the 1946 crop but below the average of 176,300 pounds. About 14,000 pounds of this seed were exported from the United States to Denmark during the 1947-48 season because of the near failure of the Danish crop in 1947.

The 1948 harvest of cauliflower seed was estimated at 35,000 pounds, compared with about 29,500 pounds in 1946 and the average of 31,600 pounds. During the 1934-40 period, Denmark exported an average of 7,748 pounds to the United States.

Production of kale seed was estimated at 50,000 pounds, or a little more than the crop of 1946 or than the average of 45,400 pounds. An average of 2,158 pounds was imported from Denmark into the United States during the 1934-40 period.

Because of the prospective high yields, the 1948 production of kohlrabi seed was estimated at 50,000 pounds. This above-average crop was about 10,000 pounds larger than that of 1946.

The 1948 production of curled-leaf and root-parsley seed was fairly large. It was estimated at 45,000 pounds, which is larger than the 1946 crop or the average of 41,900 pounds.

Production of radish seed in 1948 was estimated at 300,000 pounds. This crop was smaller than the 1946 and 1947 crops but well above the average of 188,800 pounds. During the 1947-48 season, 3,000 pounds of radish seed were exported from the United States to Denmark.

The 1948 harvest of spinach seed in Denmark was estimated at 1,000,000 pounds, compared with about 1,300,000 pounds in 1947, 1,540,000 pounds in 1946, and the 1937-46 average of 1,043,200 pounds. During the 1947-48 season, 23,000 pounds were imported into the United States from Denmark, compared with 95,000 pounds in the preceding season and the 1936-40 average of 166,265 pounds.

France

Normally, France produces important quantities of garden beet, broccoli, Brussels sprouts, cabbage, carrot, celery, chicory, kohlrabi, leek, onion, parsley, parsnip, pepper, and turnip seed. During the 1934-40 period, nearly three-fourths of the total imports of parsley seed into the United States came from France. That country also ranked first as a source of imports of pepper; second, of parsnip; third, of beet seed except sugar beet and carrot; fourth, of kohlrabi; and fifth, as a source of imports of onion seed into the United States.

During the latter part of August, prospects were reportedly good for carrot, leek, and white-onion seed but rather poor for garden beet, lettuce, and turnip.

Germany

The total 1948 acreage of the German Vegetable Seed Growers' Association in Bizonia was about 40,200 acres, or about twice the 1947 acreage. This Association numbers about 150 growers who probably accounted for 90 percent or more of the total production of vegetable seeds in Bizonia in 1948. Of the 40,200 acres, about 23,900 were planted to garden peas and beans and 16,300 acres to other (small) vegetable seeds.

Some vegetable seedsmen expressed the opinion that, because of the large quantities of fresh vegetables imported into Bizonia in 1948 and the anticipated large imports in 1949, there would be a much smaller demand for vegetable seeds in Bizonia in 1950. This increasing availability of fresh vegetables would tend to curtail sharply the 1949 acreage, from which seed would be harvested for planting vegetable crops in 1950, were it not for the fact that some important growers, who have produced seed both in Bizonia and the Russian zone, are withdrawing from the Russian zone as rapidly as possible. This exodus has been taking place despite the fact that soil, climatic, and other conditions in the Russian zone are generally regarded as more favorable for vegetable-seed production than those of Bizonia. As an indication of this, some growers pointed out that a fourfold or fivefold increase in pea production was obtained in Bizonia, whereas in the Russian zone it was not difficult to get a sevenfold or eightfold increase. Similar differences were noted in other vegetable-seed crops.

During the 1947-48 season, the United States Government shipped to Bizonia, approximately 1,837,000 pounds of dwarf green beans, 497,000 of pole beans, 279,000 of wax beans, 25,000 of broad beans, 84,000 of garden beet, 376,000 of mangel beet, 93,000 of cabbage, 177,000 of cucumber, 181,000 of onion, 28,000 of parsley, 15,561,000 of smooth peas, 4,670,000 of wrinkled peas, 16,000 of pumpkin, 45,000 of radish, 82,000 of rutabaga, 7,200 of tomato, 53,000 of turnip, and unimportant quantities of about 20 other vegetable seeds.

Hungary

Hungary usually does not have to import much vegetable seed except of such crucifers as cabbage and cauliflower. Usually this country exports beans, mangel beet, carrot, cucumber, and spinach seed. The weather during the summer of 1948 was favorable for beans, peas, and lettuce seed. Exportable surpluses of a number of kinds of seeds, including cucumber, dill, endive, parsley, squash, and tomato, were in prospect.

During the 1946-47 season, the United States exported 2,848,000 pounds of sugar-beet seed to Hungary, compared with 72,000 pounds in the following season and none between July 1, 1948, and March 31, 1949.

Netherlands

In 1948, the acreage of all vegetable seeds in the Netherlands totaled about 26,400 acres, equaling that of 1947. In 1948, a slightly larger acreage of the large seeds (beans and peas) was offset by a slightly smaller acreage of the other (small) seeds. The total 1948 acreage of small seeds in the Netherlands was estimated at approximately 11,000 acres, less than one-third of the acreage harvested in the United States.

At about harvesttime, the condition of the vegetable-seed crops in the Netherlands was reported to be good for cabbage, chervil, chicory, corn salad, dill, heading lettuce, radish, and spinach; average for garden beet, celery, cress, cucumber, parsley, salsify, and tomato; fair for Brussels sprouts, Chinese cabbage, carrot, cauliflower, kale, and onion; and poor for beans, peas, and garden-turnip seed.

For a number of years, the Netherlands was the leading source of imports into the United States of garden beet, mangel beet, cabbage, kale, kohlrabi, parsnip, radish, rutabaga, and spinach seed. That country has also been an important source of carrot, cauliflower, and turnip seed. During the 1946-47 and 1947-48 seasons, an average of 19,283,000 pounds of horticultural (largely vegetable) seeds were exported from the Netherlands. Thirty-six percent of this quantity went to Bizonia (Germany), and nearly three-fourths of the remainder was exported to France, the United Kingdom, the United States, Belgium, and Luxembourg.

Production of seed beans--broad, dwarf, pole, and runner--in the Netherlands in 1948 was expected to be smaller than the 1947 crop of about 14,500,000 pounds because the indicated smaller yields per acre more than offset the expected increase in acreage.

Production of red-beet seed in 1948 was expected to be a little larger than the 1947 crop of 165,000 pounds. During the 1934-40 period, an average of 184,578 pounds of beet seed other than sugar beet was imported into the United States from the Netherlands.

The 1948 cabbage-seed production was estimated at about 325,000 pounds, compared with only 105,000 pounds in 1947. During the years' 1936-40 an average of 201,168 pounds was imported into the United States from the Netherlands.

The prospective production of 220,000 pounds of garden-carrot seed was larger than the 1947 crop of 190,000 pounds.

Production of about 75,000 pounds each of cauliflower and kale seed was expected, compared with about 42,000 and 12,000 pounds, respectively, in 1947. The Netherlands has been the main source of cauliflower- and kale-seed imports into the United States during the past 3 years. During the 1934-40 period, the United States imported an average of 5,496 pounds of cauliflower seed and 55,210 pounds of kale seed from the Netherlands.

Although the 1948 acreage of garden peas was a little larger than that of 1947, production was expected to be smaller than that of 1947 (2,630,000 pounds) because of the very poor condition of the crop at harvesttime.

The estimated 1948 production of 1,100,000 pounds of radish seed was in excess of the 1947 crop of 1,035,000 pounds. During the years 1936-40, imports of this seed into the United States averaged 516,698 pounds, or about 92 percent of the total quantity imported by the United States.

Production of spinach seed in 1948 was indicated to be approximately 6,000,000 pounds, compared with about 7,500,000 pounds in 1947. During the 1947-48 season about 1,685,660 pounds of this seed were imported by the United States, compared with 2,066,148 pounds in the preceding season and the 1936-40 average of 2,332,337 pounds.

Although the condition of the turnip-seed crop in the Netherlands was reported to be poor at harvesttime, the 1948 production was expected to be six to seven times larger than the very small 1947 crop of 40,000 pounds. During the 1936-40 period, the United States imported an average of 133,400 pounds of this seed.

United Kingdom

The United Kingdom produces important quantities of broad beans, runner beans, beet, broccoli, Brussels sprouts, cabbage, chard, cress, leek, onion, parsley, parsnip, peas, radish, salsify, spinach, and turnip seed. It has been the most important source of imports of turnip seed into the United States. During the 1934-40 period, that country ranked second as a source of imports of beet other than sugar beet, radish, and rutabaga seed.

The 1947 production was larger than the 1942-46 average for runner beans, broccoli, Brussels sprouts, chard, leek, onion, parsley, radish, spinach, squash, tomato, and turnip seed. On the other hand, the 1947 production was below average for broad beans, garden beet, cabbage, carrot, cauliflower, celery, cress, kale, lettuce, parsnip, and peas.

Official data for the 1948 vegetable-seed crops in the United Kingdom were not available in the late fall. At that time, due to the shortage of good planting stocks of roots in the spring, below average acreages of a number of biennial crops were reported. The shortage of roots resulted from the unusually dry weather at, and subsequently to, the sowing of seed in the late summer of 1947. The acreages of several annual crops, planted in the warm spring of 1948, were reportedly larger than usual. However, beginning in June and continuing through mid-July, cold, rainy weather prevailed.

During the 1943-47 period, the average amount of seed needed to meet planting requirements exceeded production in the United Kingdom for beans, Brussels sprouts, cabbage, carrot, cauliflower, kale, kohlrabi, leek, lettuce, onion, peas, radish, and tomato. But seed production was about equal to, or exceeded, requirements for garden beet, celery, cress, parsley, parsnip, spinach, squash, and turnip.